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Handbook of Fruits, &c.

FOR

SOUTHERN TEXAS AND LOUISIANA.

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DESCRIPTIVE CATALOGUE

OF THE

Mission Valley Nurseries.

G. ONDERDONK, Prop'r.

Edition of 1888.

Established
1870.

Nursery, Victoria County, Texas.

BROWNSON & SIBLEY,

MAIN STREET, VICTORIA, TEXAS,

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INTRODUCTION.

THE Mission Valley Nurseries have been removed from their original location in order to secure better communications. We are now established on the Gulf, West Texas & Pacific Railway at a point ten miles above Victoria, and sixteen miles from Cuero. Here we have secured a station, a post-office, and the best conveniences for daily shipments. We have complete express and freight arrangements, so that we can more promptly serve our patrons.

Our post-office address is now *Nursery, Victoria Co., Texas.*

For thirty-six years the writer has been studying the questions which underlie the horticulture of Southern Texas. At first he had scarcely a precedent to guide him. Little was then known of our horticultural resources. The vast majority of our people then cared but little for any but the grazing interests, and even those who tilled the soil gave their care to two or three staple products.

He who would then suggest that Southern Texas was possessed of even a respectable horticultural capacity was sure to excite a smile of incredulity.

During the last third of a century the writer has done little else than study and experiment for the development of our horticulture. He has planted experimental vineyards containing varieties of every class of grapes known to viticulture. He has planted experimental orchards containing every class of fruit that has seemed to hold out any reasonable hope of success. He has patiently waited for the tests of time to reveal the comparative value of varieties for our very peculiar climate. He has produced and collected new seedling varieties in each department of pomology until he has finally obtained a collection of adapted fruits that he can confidently recommend to our people.

Nor have his experiments in the ornamental department been less exhaustive and complete. One sub-division after another of the general ornamental department has been pursued with studious care and unrelenting energy, until there is now no effect known in the landscape work of the older states for which he has not ascertained practical material to be used in our own climate.

These results have been attained by long and persistent study by many hundreds of carefully conducted experiments and at a very burdensome expense of capital. *Professionally*, he feels that he has attained a highly gratifying success. *Financially*, he has expended a fortune to become properly ready to begin the work of supplying our people. Quite all that he has hitherto done may be regarded as only experimental—a foundation upon which to build the work of coming years.

We have thought best to give this edition more of the character of a hand-book than is usually given to a catalogue. The reader will observe that, in this pamphlet, nothing is recommended except that which has been proven to be of value in our climate, and in every instance a frank intimation is given if there is any drawback against the value of the articles described. A careful examination is invited to every portion of this pamphlet. Every matter stated as fact is based upon the personal experiences of the writer *upon our own grounds.*

After the extraordinary care which we have exercised and the expense we have incurred to become able to *understandingly* serve our people, it can hardly be expected that we shall be called upon to *undersell* other establishments. Many of our patrons have learned the difference between *low priced* trees and really *cheap* ones. Those who require such goods as are supplied by Northern nurseries at very low rates, need not apply to us to compete for low rates. WE DO NOT HANDLE SUCH GOODS, NOR DO WE SELL AT THEIR PRICES!!

Although our business was at first intended to be only a local one, yet the developments growing out of practical operations in Southern Texas prove to be of importance to other sections also; therefore our business relations have gradually extended to remote regions not anticipated in the beginning of our enterprise. We are better prepared to supply local requirements as well as to better meet the distant demands upon our growing resources. Fortified by such study and experience as could only be prosecuted and attained upon extreme Southern ground—encouraged by the successes of the past, and vastly improved facilities, present and prospective, and the grand army of friends and patrons that have rallied around us, we look forward with large hopes into a cheerful future.

Respectfully,

GILBERT ONDERDONK,
Nursery, Victoria Co., Texas.

TO CORRESPONDENTS.—Do not fail to give post-office, county and state, and sign your name *plainly*. Important letters are sometimes signed in such a manner that the name can only be guessed at.

ORDERS.—Do not wait for agents, but send your orders by mail. Write orders on a separate page, and do not mix them up in the body of the letter.

SELECTION OF VARIETIES should be left entirely to us, except in cases where some particular sort is especially required, as we are better acquainted with the varieties, and therefore can make a good selection. When varieties are specified in the order, and the stock of such varieties has become exhausted, we will substitute varieties most resembling those called for, except where substitution is forbidden. In all cases where substitution is forbidden, we will charge retail rates for the plants furnished.

SHIPPING DIRECTIONS should be explicit. When none are given, we forward according to our own judgment; but in no case do we assume any responsibility after delivery to the forwarders.

PACKING CHARGES will be confined to actual cost of material and labor.

PRICES GIVEN relative to deliveries *at the nurseries*. If delivered elsewhere, we shall make a charge to cover cost and risks. Any person or combination of persons who, without intervention of our agents, sends us bills to the amount of \$100 or more, will be allowed a deduction of twenty per cent.

MISTAKES will sometimes occur, as we often have to employ inexperienced help, and all our packing is crowded into the space of a few weeks' time. We will correct any mistakes when promptly notified of their occurrence.

REPLACING TREES.—Some customers, after receiving their trees in good order, so neglect or mistreat them as to cause them to die, and afterwards think that we should be responsible for the loss of their trees. We wish it distinctly

understood that when a tree or plant has passed beyond our control by being delivered to the purchaser, we cannot be responsible for its treatment or the result. We furnish the trees in good order, and the customer must take care of his own trees, and take his own risk of season, treatment, of any casualties that can interfere with success. It is enough for us to stand our own losses, and we cannot, uncompensated, bear the losses of others. We are not an insurance firm.

We learn that some agents have taken the responsibility of promising to replace any nursery stock their customers may lose. They have done this as an inducement to the customers to deal with them. No customer would sell us cattle, horses or sheep upon such terms, because they all know that *it is not business*. And we want it to be understood and remembered that we make no such contracts. We publish this notice that if these unauthorized promises of an agent are taken it must be understood that they are *not our promises* and that the customer must look to the one with whom he is dealing and *not to us* to fill his agreements.

We would like to consider every agents' customers as dealing with us, but when an agent makes contracts of the kind under consideration he is doing something which he has no commission to do for us, and we *will not accept such orders*, although we may sell the agent the goods with which to supply his customers.

TERMS AND REMITTANCES.—Terms cash on or before shipment of package, except when arrangements have been made to the contrary. In cases where prepayment has not been made, and we ship without agreement to the contrary, we shall draw draft to cover the amount upon shipment of goods. Remittances may be made by draft on any reliable business house or bank, or by post-office order or registered letter.

EARLY DELIVERIES.—While our Pear and Apple Trees and Peach Trees of the common Persian race may very properly be removed in November, if the season is an average one, yet our Spanish varieties of Peaches continue to grow much later than those belonging further north. The same may be said of our Plums and Grapes, all of which are especially *southern*, and some other plants. As this makes their season of removal later, we can not, of course, deliver them as early as some nurseries which do not raise our Southern class of trees. Others who even buy much or the *most* of their stock from Northern nurseries, where the season closes much sooner than it does here, can make very early deliveries to customers. When *very early* deliveries are offered, it is a reasonable presumption that the trees do not belong to this region. We do not compete with this class of nurserymen, or *dealers*, on the subject of *early deliveries*. But we *do* deliver as soon as we can handle our trees after they attain the proper condition, and we shall not fail to do so in time to favor the success of our customers.

EXPRESS ARRANGEMENTS have been made with Wells, Fargo & Co. for special rates for all of our customers. Our packing house stands immediately by the platform so that we can ship by every train and make no charge for delivering to the Express Company.

THIS CATALOGUE will be sent free on application.

G. ONDERDONK,

Nursery, Victoria Co., Texas.

SELECTION OF GROUND FOR ORCHARDS.

PROMPT DRAINAGE outweighs almost every other consideration – and more especially so for Peaches.

SOIL which is properly drained, and which is good for corn, will generally be found good for Peaches, Plums and Grapes. The same soil should be richer for Apples, Quinces and Pears than for stone fruits. A light sandy loam is best. The lighter the soil, the earlier the trees will bear, and the sooner they will be apt to fail.

EXPOSURE is of some importance. While at the North a plat sloping southward is preferred because it is there desirable to get as much of the sun's influence as possible; yet in our climate the case is different. We do not want the first warm rays of the sun to start our trees, as they will then push out the young fruit to be in danger of late frosts. We propose a northern slope *here* as a partial remedy against early growth, but we would yield the question of exposure to any other consideration of importance.

WHEN TO PLANT A TREE.

Trees should not be hurried out of the nursery for planting before they are properly matured for removal. Some people in their desire to plant *early*, overdo the matter by insisting upon their trees being taken up while sap is yet moving too freely. But *after proper maturity*, the sooner they are taken up the better.

In this climate the sap flows, to some extent, all winter. Trees are making roots when there is no outward appearance of growth. We can fix no definite date for planting *here*. Sometimes our trees will do well to handle in November, and sometimes are hardly fit to dig at Christmas. It depends upon the season. As a rule, we may say that we begin to fill orders as soon as possible after the first *killing* frost, and continue until the planting season is over, which is about March 1st, although the planting in our own grounds continues later. The condition of the tree is of more importance than a few days of time. We never send trees out when it is too late to plant them, and we begin to ship them as soon as they are fit to handle.

WHEN the TREES and PLANTS COME to HAND

if they look fresh they may be planted at once or heeled in moist soil till you are ready to plant. If they are dry enough to be more or less shrunken, then cover the entire tree in a moist soil for a couple of days before planting. But in any case *do not allow the roots to be exposed in the sun or dry wind.*

HOW TO PLANT A TREE.

Many persons plant a tree very much as they would plant a post. Others bestow a large amount of, not only useless, but detrimental labor. We have seen by way of preparation, holes dug from four to six feet square, and as many feet deep, forming in a retentive clay, a receptacle to retain water to the injury if not destruction of the tree. The hole was then nearly filled with bones, rotten wood, and various kinds of manure. Soil was then thrown in to complete the filling, and after this preparation the tree was planted. It would take more space than we can occupy here to delineate the mischief resulting from both of these ways of planting. Don't kill your trees by either neglect or mistaken kindness, and then blame the nurseryman because your trees fail.

The plat should be in a good state of cultivation. Dig the holes large enough to admit the roots without cramping them, and deep enough to admit a couple of inches of surface soil. Cover the bottom with *surface soil* till the tree will stand no deeper than it did in the nursery (except dwarf pear trees, which should be so set that the quince stock is three inches below the surface.) Introduce the roots and earth to each other with the hands, taking care that each root is given its natural position. When the roots are lightly covered pack the earth around them carefully. We sometimes use water to insinuate the earth and roots into each other. Now fill with any surrounding soil, leaving the surface loose. Use no manure about the roots of a newly planted tree.

IN PLANTING EVERGREENS there are two conditions that must not be disregarded. We remove evergreens with as much safety as we do deciduous trees if they have such roots as ought to be sent out by a nursery. But we do it by regarding the two conditions which we will briefly present: 1st—*Never let the roots of Evergreens become dry before or during the operation of planting.* If obtained from our nursery they will not be dry when they reach the customer. 2d—*Press the earth and roots thoroughly into each other.*

Of course it is to be understood that the operator is to observe the conditions also that are required in planting other trees, especially the one of *letting every root have its natural position.* In planting evergreens I always use to have the earth *beaten* and *tramped* and sometimes *pounded* to the roots in the moist soil. Of course there must be a covering of earth above the root when this pounding is being done so as not to bruise the roots.

DISTANCE FOR PLANTING.

We have planted a peach orchard 16½ feet each way. We see that we should have given more room to the trees. Our latest planting is about 18 by 20 feet, and we never expect to plant a peach orchard nearer on common upland. If I were planting in river bottom I should set the trees 30 by 40 feet. Apple trees in this country become dwarf in their habits and can be set 15 feet by 15. Mariana plums want as much room as peach trees. Other varieties of plums can be grown at 12 to 15 feet each way. Dwarf pears may be set 12 feet by 12. Standards should be given more room, except LeConte which had better have 30 feet. Our own way of planting pear trees is expressed in our remarks under the head of *pears.*

Our Southern grapes of the Herbemont type should not be set nearer than 10 feet. We set our own 12 feet by 12. Those of the Labrusca type can be set 6 feet by 8. Those of the V. Vinifera may be grown 6 feet by 6. They are often set nearer, but we do not believe in such close planting *here.*

Do not be duped into the fallacious notion of planting trees close enough to shade each other's trunks, but depend upon after treatment which will insure each tree to shade its own trunk. (See remarks on *Pruning Plum, Peach and Apple Trees.*)

HOW TO TREAT AN ORCHARD.

Do not neglect its thorough cultivation. We insist upon cultivation of the soil among fruit trees in this country, notwithstanding the Northern directions in some cases to the contrary. *We do not live in the North.*

Sow no small grain in the orchard! Let the plow go among the trees whenever the growth of weeds and grasses or the condition of the soil requires it. Let the

plow run shallow when near enough to the trees to injure the roots, and elsewhere plow as deep as you can. Keep the ground loose, and in all respects in as good condition as it should be for any other crop. If you raise a crop among the trees while they are young, let it be a hoed crop, but plant nothing nearer than within five feet of a tree, and maintain the fertility of the soil by the application of manure. The old chips and rotten wood that collect around the country wood piles make a good manure. A light dressing of ashes is valuable. A cropping of cow peas is good, but in this case some vigilance is required to keep the vines from overrunning the trees.

PRUNING PEACH, PLUM, AND APPLE TREES.

Don't prune your trees to death. Before you begin make up your mind what form of tree you want, and then don't change from one plan to another. We have seen senseless, unintelligent cutting and hacking at trees that was much worse than no pruning at all.

We have peach trees now twenty-six years old still bearing well, that were never pruned, except to keep off the suckers from below the graft. These trees have modified my own views upon the subject of pruning.

Before our trees are sent to our customers, we cut away every side shoot and then cut off the body at from one to two feet from the ground, if the eyes on the trunk of the tree will justify it. For our own planting we cut still closer. The object of this severe pruning is to leave only wood enough to furnish plenty of eyes from which to make the future tree. Some persons object to this severe cutting because they do not understand the matter. In removing a tree we have to deprive it of the majority of its feeders, and the remaining ones cannot well feed the entire original top. By this pruning at the nursery we save, for the customer, half the cost of transportation, make his trees more likely to grow, and secure to him a stronger tree than if the top were not removed. My own peach, plum and apple trees are pruned as follows :

The tree having been cut to a stem, as described above, and properly planted, will put out a large number of sprouts in every direction. To form a low top, select four of these sprouts leading in as many different directions. Move all others and persistently keep any new shoots from supplying the places of those destroyed--training only *the four* shoots selected, and let these four selected branches do pretty much as they please.

If a lateral root from any of these four shoots should hang so low as to be much in the way, I cut it away, but cut no other laterals that are in a vigorous state. If two limbs chafe each other or are likely to do so, I remove one of the offending limbs. If a limb gets badly bruised or broken, I resort to amputation. If trees threaten to interlock limbs with the adjoining ones, I shorten in the interfering boughs. Should a tree be running taller than I wish, I check the tendency by removing the leading boughs. Should one side of the tree be outgrowing the other, I check the excess of the strongest side by shortening its boughs. If trees are treated in this manner, each tree will shade its own trunk. While I train my orchard generally on this plan and thus have low heads--there is occasionally a reason for desiring a tree to become taller and make a rounded head.

In this case, at the first pruning I should retain only one shoot instead of four, shortening the stump back to the sprout selected to stand. As this shoot grows, the lowest side limbs are cut away till the tree has attained its desired height. I do

nothing more except to remove interfering limbs or twin sprouts or shorten an occasional bough to preserve the form desired and keep down all suckers from the base of the tree. I remove the suckers at any time when they are discovered, in fact, I prune peach trees at any time that suits my convenience. But *pear* trees should not be pruned during the growing season except to rub off young shoots, pinch back leading buds, etc., to preserve the desired form of tree. Dead branches tax the energies of the tree as long as they remain, and therefore should be promptly removed.

Don't keep cutting off the spurs that form on the sides of the trunk and branches. These are preparations for fruit. We have seen the trunks and large limbs trimmed clean of spurs up to near the top of the tree, under a false notion that the good of the tree required it.

We urge the suggestion that whatever growth the peach, plum pear or apple trees are not allowed to make within a short distance of the ground it will not produce at all. That it is utterly useless and destructive to try to run the trees up to an unnatural height. When peach trees have been treated as we have suggested for about two or three years from planting, they are ready for a careful permanent system of treatment which will improve the size of the fruit.

In January, or before the new growth starts in the Spring, cut away half of each twig of the former year's growth. Let each cut be made just above a leaf bud. The strongest shoots might be cut a little shorter and the weaker ones a trifle less, so as to maintain the symmetry of the tree. This treatment will reduce the number of peaches on the tree, but will vastly increase the size of those remaining. While this treatment is less important here than at the North, yet it may be applied in our orchards with advantage.

That our brief remarks may cover as much ground as possible, I will say that in *all* pruning, whether of fruit trees or flowering shrubs, we must not lose sight of this general principle—viz: *That trees or shrubs that bear their fruits or flowers on wood of the current year's growth should be freely pruned in winter; while those which bear their fruit (or if ornamentals, their flowers,) on wood of the former year's growth should be pruned more sparingly.* The reader will readily see the common sense of this universal rule.

PEACH CULTURE IN SOUTHERN TEXAS.

These chapters were originally written for and published in the San Antonio Weekly Express. We were solicited to give them a more permanent form. We published them in our former edition and have concluded to continue them in this issue as embodying our views on this subject.

CHAPTER I.

AN OBSTACLE.

In a series upon this subject it is natural to first take a brief view of an obstacle that confronts the cultivator. The first, and one that we will make the subject of this chapter is the

TREE BLIGHT.

In most of the occupied portions of Texas, there are spots of ground upon which cotton and some other plants die out, especially during the early part of the season. All of the grasses seem unaffected by it. Some speak of the ground upon which this blight occurs as "poison soil;" others speak of this singular "dying out" as a

result of "*cotton blight*;" and I do not know how many more names have been given to this wide-spread scourge. We have a variety of theories about the cause of this blight. I have my own theory concerning the matter, but think it would be out of place in the series of articles I have now begun. For present purposes it is sufficient to define it as a blight. While it is, in different sections, attributed to different agencies, yet there seems to be sufficient uniformity in its symptoms and effects in different localities to lead us to presume upon the identity of the scourge. This blight is quite sure to kill every apple and pear tree and every grape vine which it attacks, and sometimes destroys peach trees, rose bushes, and a great variety of trees are killed by it. I have seen the trees of a whole orchard—one by one, in regular succession—yield to its withering power.

TO DETECT THE BLIGHT BEFORE PLANTING,

plant cotton or ground peas on the spot. If either of these remain uninjured at the close of the first season, then there is no tree blight in the plot, and you may safely set your trees. But suppose one has already set an orchard and afterwards discovers that he has located it in an infected spot,

IS THERE A REMEDY?

I once found that this blight had begun its ravages on my vineyard. Wood was abundant near by and the affected spot was small, so I built a large fire, gradually moving and extending it, till the whole spot had been heated to a redness. I threw into the fire everything combustible that was on the spot. I went ahead of every sign of blight and burnt vines that seemed to be unaffected. This proved efficient. I replanted the burned plot and had no more blight there to this day. This was twenty-two years ago. So I may safely say that I cured this spot of "*blight*," or rather killed the myriads of insects that caused it. It is to be regretted that we have not a state entomologist to study up such cases and learn some practical mode of destruction, so that they could be dealt with where the pest extends to large patches. It generally appears on a too large scale to burn out in this manner, and then the best way I know of is to seek another spot upon which to set a new orchard. I have in my mind a case in which the owner of a blighted orchard set a second orchard of two hundred trees, only a couple of hundred yards distant. In this case the blight ceased after killing about a hundred trees, and the remainder, like the new planting, lived to a good old age without becoming affected. In our next we will notice the question of drainage.

CHAPTER II.

DRAINAGE AND SOILS.

For convenience and brevity and to avoid repetition, we will treat together the questions of soil and drainage. Defective drainage is the most serious obstacle in the way of peach culture. Whatever importance may properly be attached to questions of soil or aspect, yet, in fruit culture, the question of drainage outweighs every other consideration, and more especially so in peach culture. Peach trees cannot endure wet feet for a great length of time. I shall probably find no better place to say that injudicious irrigation has killed many a promising tree.

For peach trees it is not sufficient that the water can run off—but it must run off promptly. Many a spot of ground which would be considered well drained for corn or cotton, or small grain, will nevertheless retain water too long for peach trees. If water stands on the surface a few hours in a peach orchard, it is doing mischief to the roots of the trees.

If the soil is that kind of sandy loam that retains so much water as to remain boggy long after rain, that is a grave objection to it for a peach orchard. Such a soil may be, and generally is, splendid for the growth of the trees under ordinary circumstances; but in a very wet season its power of retaining so much water is often fatal to the trees. I have seen this result even where the surface drainage would be called good. An orchard in such a place may do well for a dozen years and then be destroyed by a rainy spell, which makes the ground boggy for a month. But if you have a light sandy loam, that has both good surface drainage and a good under drainage, then you have a perfect spot for a peach orchard.

It has been observed by many that the clay subsoil, immediately below their sandy loam, is very uneven, so that if the surface soil were removed the clay would present a surface like what we call "hog wallow" prairie. If you have such a subsoil of clay it will hold water a long time in the little basins formed by its uneven surface, and a long wet spell is sometimes so nearly equal to a continued overflow that the peach roots may be so far injured that when the drought of the following year comes along, the trees have not sufficient nourishment from the few remaining sound roots to support them, yield to the power of the drought and die. Many are so far injured by the water of the clay basins that they do not even wait for a dry spell to die in. There are many dead and dying orchards from this cause all over Southern Texas. Many orchards with a pretty fair drainage are so far injured at the roots by an unusually wet spell that in the following spring the trees shed much or even all of their fruit and perhaps even maintain a sickly yellow for a season till new root feeders have formed sufficiently to properly sustain the trees.

There is much of this kind of clay sub-soil (with clay basins) in Southern Texas. I do not want to be understood to say that this clay is not good for peach trees—on the other hand I believe it is good for them when not formed into clay basins. Nor do I want to be understood to say that the soil above this clay is not good, for I believe it is good when properly drained. But, at the risk of some repetition, I will say that it is the clay basins which hold the water that do the mischief wherever these basins exist.

Where one is compelled to plant upon such a plot, or not at all, there is a simple but not always cheap remedy.

An underdrain, three feet deep under each row, will preserve the orchard. Of course this underdrain should precede the planting of the orchard, or it could not be under each row. But if the orchard is already planted upon ground that has this defect, it would be much improved by an underdrain between each row as the best that can yet be done.

Of course these underdrains must have a good outlet. Where tiles cannot reasonably be obtained, a good substitute for tiling can be made of plank. Two six-inch planks nailed together at their edges so that a cross section would resemble an Δ , would answer the purpose. The filling of the ditch should all be of the surface soil, leaving the clay from the ditch to be mixed with the surface soil of the plot.

It seems to be the case that wherever we have the red clay as a sub-soil, it usually lies so even that no clay basins are formed. Even if they exist in *such clay* I think that it will hardly hold water long enough to prove a serious matter. This clay also seems favorable to peach culture. The soils upon it are, I believe, generally of a firm nature and seldom boggy. If the surface drainage of such a plot is even tolerably good, it is a good site for a peach orchard. I have, on such ground, trees over twenty years old and still productive.

Many persons prepare for tree planting by digging enormous holes into the clay sub-soil, filling them with earth, manure, etc., and thus imitate the natural clay basins to which I have referred, and they are quite apt to reach such results as the clay basins give, only they reap them more promptly and with greater certainty. We here refer the reader to our remarks under the title "How to Plant a Tree."

Reviewing the combined question of soil and drainage, I would say that I prefer sandy loam for peach trees if the drainage is complete. But I must insist that no excellence of soil or aspect can compensate for defective drainage. So if I had to express the largest amount of truth on this subject in a single sentence, I should say that the best-drained soil, if reasonably good, is the best place for a peach orchard.

The summits of elevated places where no water can flow from other ground afford good sites for peach orchards. The tops of live oak hills are especially favorable.

CHAPTER III.

In writing a series of articles upon this subject, it would be desirable if we could examine in detail, every principle and practice that bears upon the subject. But this would involve an outlay of time which I cannot now spare. I hope, however, at some future time, to do myself the pleasure of bringing before the public, in a convenient form, the conclusions reached from experience and observation in Western Texas during the last thirty-five years. But for the present I must be contented at a survey of only the landmarks that define the way of the most successful peach culture in our general section. We now come to a department of the subject which is too often overlooked—I mean the questions relating to

CLIMATIC ADAPTATION.

It is recognized by intelligent minds everywhere that within each separate department of both animal and vegetable life there are distinct constitutional differences. For example—in the animal kingdom when we look at the bovine department we see a large number of different breeds all under one general name of cattle. Yet these different breeds, or as we may correctly express it, these different *varieties* of cattle have qualities and capacities very widely differing. We find that some varieties are better adapted to certain purposes, or section, or climate, than another. These differences are found to have become constitutional.

The same is true of horses, of hogs, of sheep, and even of men. It is noticeably true in the bear family. Each general region has its own peculiar type of bears. The grizzly of the Rocky Mountains never invades the hills and valleys of Texas. The white bear of the polar regions, if given the freedom of our forest, would not live a week in our Summer.

If we turn our attention to the vegetable kingdom we find differences analagous to those in animal life. Let the farmer of Southern Texas send to Minnesota for oats, or wheat or corn with which to plant his fields, and while, perhaps, in an exceptional season, he may reap a fair crop, yet he will generally fail. While some crops, which can be quickly made, may here encounter, during their short time of growth, conditions so resembling their season of growth in their natural habitat as to suffer little or no deterioration by removal to a different climate, yet such products as require a long period of time to reach perfection are quite likely to reveal a constitutional want of adaptation when removed considerably southward.

As fruit trees must be exposed to all the vicissitudes of climate through the entire year, it follows, as a natural consequence, that they must be subject to any effects which the climate is capable of producing. Thus habits of growth, habits of bearing, and the durability of the tree, are all affected by climate. In cases of some kinds of trees the tax upon their resources is so great as to undermine their constitution and hurry them to an early decay. In fact, the history of the subject, and results of universal observation of students in this department, have crystalized into the acknowledged theory the world over, that nature has set her bounds for each variety of fruit.

And here it is well to observe that the great peach family has been divided by the Grand Architect of nature, into races as distinct from each other as are the different races of men. And while each race of men can become adapted to the conditions of the other, we find that this is not to a great extent true of the different races of the peach. Each has its proper zone of habitation, and when we carry them beyond it their very constitutions rebel against the change and they refuse to give us success.

The Persian race, belonging in the higher latitudes, should not be brought below the limits assigned by nature.

While latitude is conceded to be a general guide in estimating the possible habitation of any product, yet physical geographists have found that from modifying causes the lines of equal temperature, which we call isothermal lines, make important variations from the lines of latitude, and that these isothermal lines, with the modifications resulting from different degrees of humidity, determine the natural places of habitation of not only the fruits, but each form of vegetable life, and right here

A GREAT PRINCIPLE IN NATURE

is often overlooked. We should keep in mind the great principle or rule of nature, that each vegetable product is more vigorous as we approach its polar limit of perfect development. When we pass its limit of perfect development we find marks of deterioration from the rigors of climate. In cases of fruits the constitution and longevity of the trees are impaired, although perfection in fruit may be obtained to the polar limit of existence. Thus in peach culture we find that as we approach the northern limit of this fruit, while the quality of the fruit is fully maintained, yet such weakness has the stock of trees attained in comparison with those of forty years ago, that it often excites the inquires of old observers.

And when this Persian race, even if possessing all of its original strength, is brought to our zone where it is not only unadapted, but is subject to the principle just named, we see a double cause of its failure.

And here let us recall

ANOTHER PRINCIPLE

that has been too much lost sight of by our Northern nurserymen, and it is one that cannot be denied, and we are sure that its non-observance has done quite as much, perhaps, as their climate to undermine the constitution of their trees.

While it is doubtful whether grafting or budding, when properly done, interfere with the constitution of a tree, yet it is true that the *seeds* grown upon a grafted tree are reduced in vigor and will not produce as strong trees as seeds grown upon

seedlings. When seedling orchards became scarce at the North, the nurserymen there planted such seeds as they could get, which were generally seed of grafted trees. They have continued this process so long that an additional degeneration has overtaken their entire stock of peach trees. And so great is the deterioration from the different causes that most of their fine peach orchards fail at from eight to eleven years from the date of planting. *And yet many of our people continue to buy peach trees from that degenerated supply!* We will follow up this matter in our next.

CHAPTER IV.

In our last we showed some of the ways in which the whole Northern race of peach trees became degenerated and deplored the extent to which that deteriorated race has been supplying orchards for Southern Texas. Let us now turn our attention to another phase of this matter.

Having been grown so long at the North, and although degenerated in vigor and longevity by its Northern residence, yet the peach became in a certain sense, acclimated there, and in fact there was established a strain peculiar to the climate in which it has so long existed. It would be a natural inference that when a stock of trees had been degenerated by being carried too far North for a healthy existence, that to again bring it Southward would restore the lost vigor. But it has been found in actual practice, that after the degree of acclimation which the peach attained there, it was subject to the

CONVERSE PRINCIPLE

that while fruits generally are improved by being carried toward their polar limit of perfect development—that they are deteriorated by being carried toward their equatorial limit. And yet our people have been getting their trees from Nashville, Bloomington, and even points still further North, to be planted in Southern Texas! and when they find their trees unproductive they wonder (! ! !) and cry out "*what can be the matter with the trees?*" and at once conclude that this is not a peach country, without reflecting that they have been doing such violence to the principles of vegetable life that they thus secured their own failure.

But right here some one will say that he planted trees from Mobile or New Orleans or Eastern Texas—or perhaps from a nursery in his own neighborhood—and yet has experienced the same results. And such a one will ask why he also failed as completely as the neighbor who got his trees from a Northern nursery. Surely there is a reason for his failure. I will try to point out the reason if "poison soil" borers, or want of drainage, or his own neglect had anything to do with it, for either of these could have killed an orchard whether of suitable or unsuitable trees. This brings us again to the matter of

UNSUITABLE TREES.

In the first place we will note that some of our Texas nurserymen buy a part of their trees from Northern nurseries, and in such cases the customer may as well have sent to the North and got his trees from first hands. In the next place I will say that I do not know of a nursery anywhere in the South, except our own, that does not make up nearly their entire supply of trees from this same degenerate race that their Northern brethren use. This is the whole thing in a nutshell. It does not mend the matter to say that the yellow St. John originated at New Orleans, or Lipscomb's prize is a seedling from Montgomery county, Texas, or that this or that

variety originated in Georgia, Alabama, Mississippi or Texas, as long as the fact remains that it belongs to that unadapted stock of which we are complaining. A tree having been grown here from seed is no proof of the race to which it belongs any more than that because a man was born in a stable he should be regarded as a horse. I have seedlings originated from the Persian race on my own premises, from seed grown here by myself, and these seedlings show every sign of non-adaptation peculiar to the race to which they belong.

I do not say that by continuing for a long time, through many generations of trees, that a final acclimation would not result. I believe it would. But I do say that the nature of the Persian race or its constitutional want of adaption to our climate cannot be eradicated through the seed in only a few generations of trees in a genial climate. It is more deeply seated than that. Another may say that he has even raised his own trees and grafted or budded them himself, and yet his results are no better than when he bought from a Northern source. I will answer such a one with a statement that general experience has proved that when we graft a tree we not only propagate the *variety* of fruit, but the variety of *tree* with its *entire habits*, except in cases of dwarfing.

When I bud from a plum tree upon peach stocks, I get simply a plum tree with peach roots, and of the very variety of plum which I grafted from, whether early, late, large or small.

When I bud from a peach tree that is diseased, I find that the disease is propagated with the tree. When I bud from a peach tree of the Persian race that will not here, once in ten years, produce more than twenty-five peaches at a crop, I uniformly find that I have thus propagated trees that only bear in the same way, and that show all the points of weakness exhibited by the tree which I budded from.

When I bud from a tree of the Southern Chinese race, or from one of the Spanish race that our people call native seedlings—one that is a heavy bearer—I find that I have produced trees that are as productive as the trees from which my buds were taken. If this were not so why should we bud at all?

In general terms (except in cases of dwarfing), I propagated by budding the same thing from which my buds were taken with the entire habits practically continued in the product, very seldom finding that the stock has any very marked effect upon the resulting tree. So I feel very safe in saying to the reader who budded from the unadapted tree, that he surely would, and did, find that he had propagated all the defects of the tree from which he budded, and had no right to expect any other result. Of course, then he would fail with them just in the same way as he did with his Northern trees. Here I wish to point out to the reader

AN UNEXPECTED DEVELOPMENT.

While I have varieties of the Persian race that have been budded in extreme Southern Texas for more than thirty years, and others of the same race that have been thus propagated here ever since the introduction to the public, and while I cannot see that these varieties seem to be any more productive or any better adapted here than at the beginning of their culture here, yet I have been surprised to learn that when these trees so produced here have been carried, even only a short distance Northward, they have proven much better bearers than trees of the same varieties that have been raised further northward. While I did not foresee this development, it is now very easy to refer it to a general law which I have already stated, but which can scarcely be too often repeated in this connection, viz: that fruit trees are im-

proved by being carried toward their polar limit of perfect development. This fact is of great value to those occupying the belt of country that lies just below the line of success with the Persian race, and even further North. Upon this principle we have established our nurseries as far South as it is practical to carry on general nursery operations.

In my next I propose to present, at least, a partial remedy against the disappointments in fruit culture that have followed every effort of so many enterprising men in Southern Texas.

CHAPTER V.

We may as well pause here, and take a chapter for a word of explanation. We have had it suggested to us that although nature has divided the general peach family into five races, yet that our *terms* by which we distinguish these races from each other are "*arbitrary*."

We reply that in speaking of *things* we must have *terms* by which to designate them, or we should be involved in frequent confusion or cumbersome circumlocution. It is a poor thing that has not about it enough that is sufficiently distinct to suggest a name for *itself*. If it has this then the name is *not arbitrary*.

We speak of the *Persian* race because we can readily trace it back to Persian origin.

We speak of the *Spanish* race because, although it is probably of final Persian origin, yet we have not been able to trace it beyond its Spanish possessors, and if we should, still it seems to have taken its distinct characteristics in Spanish hands.

We speak of the *Northern Chinese* race because it is traced directly to China, and because it is more Northern in its habitation than any other race of Chinese peaches.

We speak of the *Southern Chinese* race because it has a more Southern position in its natural habitation.

We speak of the *Peen To* race because we understand that the term signifies *flat peach* in the Chinese language.

We do not say that these are the best possible terms by which these races of peaches should be distinguished from each other, but for the present, until better authority shall have given names, we shall designate these races according to the above nomenclature.

CHAPTER VI.

In former numbers I have given attention to some of the causes of the failure in peach culture in Southern Texas. I have endeavored to point out that while poison soil, peach borers, defective drainage, and neglect had each borne their part, and either one may effect the success of an orchard, yet that the grand cause of dissatisfaction, disappointment and failure was that our people have been planting trees from a race not suited to our climate. The question very naturally arises:

WHAT IS THE REMEDY?

One part of our remedy lies in not planting trees of this class. Another part in using the Southern races that are found to be adapted to our region. We will mention them separately.

FIRST—THE SPANISH RACE.

We already have a hardy race of trees that suits our climate well, and is very productive. It has been cultivated in Southern latitudes till it has become thoroughly adapted to Southern climates on the lower border of the zone in which the peach has been considered possible. The vigor of this race from Spain has not been diminished by its treatment in Mexico and Texas during its long existence here. If, before its introduction by the Catholic missionaries, it needed to be established into a distinct race, yet its propagation here for more than two centuries of time has given to the trees all the characteristics of a separate and distinct race from that now in general cultivation by the nurseries of the United States and Europe.

It has extended in the extreme South, from Florida to Mexico. It has made its way up the Mississippi and other streams. It has overrun Texas and every part of Mexico where it will flourish.

Everywhere the trees have been recognized as hardy seedlings, which, although not claiming the highest excellence in quality, were nevertheless successful growers and fine bearers, often developing choice varieties. They are now known all over Southern Texas as the most reliable race of peach trees that have been generally tested by our settlers. Surely we shall hardly find a better foundation upon which to base improvements.

When the Persian race was disseminated among our people, some of them grafted from it upon these vigorous Spanish stocks, thinking that the superior strength of the stock would be imparted to the newly made tree, and thus they would get the fine qualities of the Persian race combined with the hardy character of the Spanish. But, however reasonable this appeared, yet every one knows how this expedient failed (as we represented in a former number), not because the new trees were grafted, but because they were developed into trees of the Persian race.

About thirty-seven years ago I began to study this race of seedlings. I saw how hardy, productive and long-lived it was, and embraced the belief that it could be vastly improved. I spared no pains to learn what could be done towards

THE DEVELOPMENT OF THE SPANISH RACE.

The beginnings of an enterprise are almost always feeble. In its early stages it generally progresses slowly. In this respect, this enterprise proved no exception to the general rule, and this one of developing a valuable list of fruit, from even such a beginning, would be a life-long undertaking.

Then came the war, with all its crushing calamities—years of absence in military life, of distracting thought, of scattering material and dissipating capital, terminating in a shipwreck of quite all that had been accomplished. But perseverance is a mighty agent of success.

Thousands of seedlings were fruited in the hope of finding, here and there, one of standard merit. Such as appeared valuable were preserved, while all the rest were sent to the brush pile to make room for another installment of seedlings to be treated in a similar manner.

This plan has been continued to the present day, and has developed some choice varieties. These were all grafted for preservation. Meanwhile, valuable seedlings were found in the many seedling orchards all over Southern Texas. Cuttings were taken from these and preserved by grafting. Large experimental orchards were made up, consisting of the varieties collected from Spanish seedlings of Texas. Time

was then allowed to test the comparative value of the varieties in the collection. Careful comparisons of the varieties in these experimental orchards were made from year to year, and enabled the rejection of those less valuable and the retention of such as were found to be superior; and thus, finally, a revised list was the result of the protracted enterprise.

This, in connection with similar efforts in other departments, made our premises little else than a horticultural experimental station, at our own expense, for many years. But it seemed a necessary prelude to our future enterprises, and we adhered to the policy till we have reached a large part of the results at which we were aiming. And here let me say regarding the advice to plant seed in order to secure a reliable orchard, that it must be remembered that while it is true that the orchards so raised from our native seed will be hardy and productive, yet it is also true that the greatest number of such trees will not prove to be varieties of merit. But if you want a good orchard of good peaches then buy grafted trees of acclimated varieties such as can be got at the Mission Valley Nurseries, and you will have all the hardiness and productiveness of the native seedling, combined with the quality of the finer varieties.

CHAPTER VII.

In former numbers we have considered the fact of the unreliable character of the varieties of the Persian race when planted in extreme Southern Texas. We refer to the fact that at tide water, and for some distance toward the interior, the Persian race is worthless—that as we go farther we reach a belt in which they usually produce sparingly and occasionally bear a good crop, but, on the whole, are so unreliable as to disappoint and discourage the cultivator, while still higher in the interior these varieties give reasonable success, and yet in the regions still beyond this they are considered successful.

We observe that where these varieties are a partial success these seasons of non-productiveness follow mild winters when the isothermal lines lie temporarily further northward than usual; and conversely that the productive seasons for this strain follow our severe winters, when the isothermal lines lie more southward. And when we compare these last two facts with the fact that this race generally succeeds in a more rigid climate, we have a solid line of facts that combine in a very marked confirmation of our theory that the degree of success or failure which is obtained with this Northern race, is not a question of soil, but a *result of climate*.

We have presented the native peaches, or, as we have chosen to define them, the Spanish race, as a sound basis upon which to construct our orchards in Southern Texas. But, while we recede from nothing which we have claimed for our Spanish race, yet we must concede that there is one want which it does not yet supply. It has given us no extra early varieties. What shall we plant then to secure extra early peaches? This is a real difficulty. While we shall probably develop much earlier varieties from our natives than we now have, yet that prospect does not give us a present supply. As a partial remedy we propose some varieties of

THE SOUTHERN CHINESE RACE.

While writers upon the origin of the peach universally state that "the peach originated in Persia" yet I do not think there is any way of proving that China may not be claimed also as a primitive home.

While the Western nations carried the peach westward from the place of its origin and have made wonderful improvements upon the original yet the Chinese made developments of, or discovered types very different from anything we have seen in the West. They seem to have found originally, or else developed both northern and southern types which differ so widely from each other, that it seems hardly proper to define these lines of difference as those of mere strains but rather allow them the real prominence they present and admit their identity as races.

The Southern Chinese race seems perfectly at home all over Southern Texas. It is productive, even after the mildest winters, and the entire race, so far as we are acquainted with it, is earlier than the earliest Spanish variety. This race then is a valuable acquisition to a region where the early varieties of the Persian type are so far unsuccessful as to be unprofitable. The developments of this race among us have only just begun, and yet they are such as to excite the liveliest interest. Already we have five choice varieties, besides others not yet disseminated, making a succession from the last days of May to the Spanish varieties. We have now a lot of seedlings from which we have every reason to hope to obtain a variety to rival in earliness the Alexander. While the *Peen To* race has, thus far, proven itself too far North with us, yet we may hope that some of its seedlings may prove late bloomers and be found adapted to our region as well as among the oranges, lemons and pineapples of Florida.

When we reflect what has been done with certain strains of the Persian race in the line of developing early varieties and remember the great length of time that has been required for its accomplishment, and then consider what a very short period has elapsed since our first acquaintance with the Southern Chinese race, we may well expect that at no remote day we shall exceed any limit of earliness that has ever been proposed.

While the Northern Chinese race generally are very successful in Central and Northern Texas, yet the coast region is below their proper zone, and most varieties of this type are not successful here except in special localities where local modifications enable them to succeed.

CHAPTER VIII.

REPRODUCTION OF VARIETIES OF FRUIT FROM SEED.

In Southern Texas, among persons whose notions have not been corrected by experience, it is a very common mistake to suppose that if they plant seed from good fruit only they will be sure of producing only trees that will bear fruit equal to, if not identical with, the fruit from which the seeds were taken. They think that varieties of fruit are reproduced from seed with as much certainty as are varieties of potatoes or any garden vegetable.

However amusing this notion may seem to those who know better, yet it is a more serious matter to those who are going to risk their understanding of this principle in the orchard they are about to plant, instead of procuring improved trees from some reliable nursery.

In 1858 I purchased the entire crop from a certain favorite peach tree. Reliable improved trees could not then be procured in this country. My design was to secure something desirable from it, and I expected to obtain a few individual trees from the lot that would be an approximate reproduction of the original, or a possible improvement. I brought to fruiting about one hundred and fifty trees from this

lot of seed. Twenty of them bore a marked resemblance to the original tree, the fruit differing in size and season of ripening. A few did not differ in any perceptible way. One was a decided improvement upon the original from which I took the seed, the fruit being more uniformly large and excellent. This one I named Underdonk's Favorite. The other one hundred and thirty-two, which came from this lot of seed, presented almost every possible variety of character and appearance. So my result was one very choice variety, a few rather desirable, some rather ordinary and the greatest number positively mean. And yet my success in this experiment with seed is greater than I should obtain in one experiment out of twenty. Out of another lot of sixty seedlings I obtained one worth grafting from. Another lot of five hundred gave only one from which I was willing to graft. Another lot of five hundred seedlings yielded two which I considered worth grafting from. Another lot of three hundred seedlings gave one valuable variety. Another lot of two thousand seedlings gave none that I was willing to admit as worthy of adding to my list of valuable varieties. I planted plum seeds from a large number of fine plums. I got about five hundred varieties from this lot of seed, and not one variety in the whole lot had any considerable resemblance to any variety from which I planted seed. And yet in all of these cases I used seed from choice, selected fruit, produced over thirty-five hundred seedlings and obtained only six really very choice varieties. It is true that there were sixty or possibly a hundred trees of fruit which, although not good enough to graft from, were nevertheless good enough to preserve as fruit trees. But, while this was the case, yet the largest number of them ranged from common to miserably mean. And who wants to bring thirty-five hundred peach trees to bear in his orchard to get even a hundred good ones, while he will have thirty-four hundred ranging in quality from common to mean? supplying fruit for six weeks of time, when a hundred trees, every one bearing good fruit and ripening in succession for six months in the year, can be bought at the nursery for twenty dollars.

"But why," the incredulous will ask, "can we not get from our fruit seed the same varieties as those from which the seed were taken?" The sensible reader will ask if the laws of nature are not regular and certain. Then why this wide variation in fruit resulting from seed taken from the same tree? I will answer.

If the reader will examine a peach blossom, or the blossom of any fruit tree, he will see in the center, standing distinct and alone, a tall, stem-like looking object with a peculiar termination at the top. The central object is called the pistil. The upper termination is called the stigma, and is the female organ of reproduction for this particular bloom. Arranged around the pistil may be seen a large number, perhaps twenty-five or more, thread-like organs called stamens, each terminating at the top with a flat cushion-like appendage called the anther. The anther may be regarded as the male organ of reproduction. The anther holds the pollen, which, to the naked eye, appears like a very fine dust; but when examined under a magnifier of sufficient power each particle presents to the eye the most delicate form.

Now if no pollen from any anther should ever reach the stigma of the pistil of any given bloom, then no fruit could ever result from that bloom. But whenever any of the pollen from any of the anthers of any bloom is lodged upon the stigma of the bloom, the ovary, which constitutes the lower part, becomes fertilized, and the seed of the future begins to develop. The variety of pollen fixes the variety of the coming seed. The fruit surrounding the seed, is, in a botanical sense, only a matured ovary, and exists only to secure the development of the seed. It is not

realized by every one that the fruit that we so highly prize, and for which we cultivate the tree, is, after all, only an incidental result in the production of the seed for which we care so little.

In the above analysis we see that the *fruit* resulting from the fertilization of each particular bloom, is, in a proper sense, only a developed portion of the tree upon which it grows, and, therefore, is not changed in variety by the character of the pollen which fertilized the seed enclosed in it, while the *seed* in accordance to the fixed laws of reproduction, necessarily partakes of the peculiarities imparted by the pollen by which it was brought into being.

If every stigma were fertilized with pollen from the stigma's own tree, then the trees resulting from such seed would reproduce exactly the same variety of fruit. But there are circumstances that combine to defeat this result. The stigma and pollen of a bloom not being both in a stage of maturity for fertilization at the first opening of the flower, constitutes an important condition. The existence of other trees with their burdens of pollen within fertilizing distance constitutes another condition no less important. Then the busy bees—the myriads of insects that buzz from flower to flower, and even the passing breeze that floats by the tiny bloom—each bear their own portion of the minute particles of the fertile pollen, and although without design mingle them in an untold number of combinations, scattering them in countless directions to distances little imagined by the casual observer, and establishing modifications as numberless as variety itself.

CHAPTER IX.

We have endeavored to show that if we of Southern Texas do, for some special reason, plant any trees of the Persian type, yet they should never comprise the bulk of our orchards. I will now specify under just what circumstances I should plant trees of this type. For while the stock of trees of this race is especially degenerated when removed to our climate, yet it does contain many very choice varieties of fruit which we can never excel and some of which we have not equaled.

Those of us who live below the line of possible success with the northern varieties have no present remedy beyond the present development of the Spanish and Chinese races of peaches, except that we migrate to regions of a more rigid climate. But while we of the Southern counties have not a present remedy, yet we may well hope for a future remedy not far distant. The Persian type has probably quite reached its limit of earliness. While it has for centuries been subject to the improvements of horticulturists, giving it time for the fullest development, yet we have but just begun with the Southern races. And when we consider our improvements during the last quarter of a century we can cast a cheerful glance into the future, and easily expect rapid progress to mark the way of the years to come.

But many of our readers live within the zone of partial success with the Persian race.

Some who are thus situated have very high ground upon which they could plant an orchard. Let such remember that every two hundred and fifty feet of elevation attained is equivalent to a degree of latitude. This is a valuable item to them. If they are willing to cultivate an uncertain crop for the sake of its luxury when it "does hit," then let them plant some tree of early northern varieties—Beatrice, Louise and Alexander, Rivers, or others of the same season. Sometimes they will get a fair crop of extra early peaches, and very often they will get a few

** in Texas.*

peaches, while sometimes they will get no fruit at all. But if they insist upon extra early peaches—earlier than we have named of the Spanish and Chinese races, then the above is the best that we can do without migrating to a country of cooler winters. But if they *do* plant such varieties in the low regions of Southern Texas, let them go into it with the understanding that it is an uncertain venture, in which only partial success is even possible; and let them remember the principle which teaches that they should get trees which were raised more southward than their orchards if possible.

While the varieties of the Persian race will not bear an average of twenty peaches to the tree in my own grounds, yet if I were located seventy miles further northward I would plant moderately of the extra early varieties of the Persian race, and a few of the best later varieties, while I would principally rely upon Spanish varieties, and even if I lived in the regions of success with the Persian race, yet I should plant largely of the Spanish race as experiments in different sections of higher latitudes show these varieties improved by being carried northward. As the preface to a work should always be written after the work is completed, so in the present case, that which might have appeared in the preface must be presented as a conclusion.

There are many matters of interest properly included in the general subject which I have been considering. It would be pleasant to examine many details that could be named, but concerning which I have been silent. It is one thing to carefully survey an entire region, and quite another to simply pass through it and point out the land marks by which one must define a general way. And this last has been my policy in dealing with the outlines of a subject that, if amply considered, would fill a large volume. I have done little else than present such general principles as seem to lie at the bottom of success of peach culture in Southern Texas.

I have not the presumption to claim to “know all about” this subject, but for thirty-seven years I have been studying it with all the light that has been shed upon it by my own reason, observation, experience and the help of the vast number of men who have each contributed their share in the mighty work of developing the vast slumbering pomological resources of Southern Texas. Our region contains plenty of men who, if they had given themselves to the same work, could have explored the same field with as much energy and faithfulness, and, quite likely, with earlier and more thorough results. And our region is also full of men at the present hour who have reached quite the same general conclusions that we have drawn in this series of articles. But horticulture has not been their profession; therefore they naturally pursue each his own special object in life.

I should be dull, indeed, if, after devoting my life to horticultural subjects, I had not gained a respectable amount of information in the line of my profession. But my readers, *I do not know it all*. I am learning every day. I now learn more in one year than I used to learn in ten. I now often wonder at my own clumsiness in certain departments only a decade back in my history, and if the developments of the future are to keep pace with those of the past (and why not?) then if I live another decade I shall look back with wonder upon the status of our improvement in 1888. In each special branch of horticulture, as in other departments of human enterprise, there is a wide room for improvement. So I do not ask the reader of these chapters to regard them as infallible. They are only the present result of my best information from all sources after a patient study of a little more than a third of a century.

OUR LISTS OF PEACHES.

We have rearranged our lists of peaches that they may be in better harmony with the progress that has been made in Southern peach culture. The developments of the different races of the peach in our low latitudes, and the comparative position which each is found to occupy upon a scale of isothermal lines, seem to require that we should not ignore the distinctions that have been made by nature, and which so persistently force themselves upon our attention by their practical relations to an important department of our business life.

The development of the Spanish and Chinese races of peaches promises vast results to Southern pomology. We have reached that point in the study of peach culture for this region that we recognize a very unexpected amount of difference in the very narrow zones that succeed each other from the coast country to the mountains. Our communications are extending—our trade has ceased to be purely local—and we realize that we must meet the growing demands of more extended intercourse. We have, therefore, decided upon separate lists of peaches to accommodate climate conditions of customers in different sections.

Some of the boundaries given upon the isothermal chart may need correction, but we are satisfied that we quite correctly state the relative position of these races. While all careful students of physical geography must admit that on account of the unequal distribution of heat during the extremes of the year, the isothermal lines of the world generally are not a sure guide in estimating the possible productions of a climate, yet for our purposes, in speaking of the products of Texas, such are the conditions that we may take these lines as a general guide in our remarks about our peach culture.

We refer the reader to the report of the United States Commissioner of Agriculture for 1887. Page 648 to 651.

THE PERSIAN RACE occupies the most Northern position of any race of peaches. It extends to the Northern limits of peach culture, and seems, in some varieties to succeed well down to about the isothermal of 65, while under the modifying influence of local causes it even runs down to the line of 68. And a very few varieties have, under the most favorable and rare conditions, given fair partial success as low down as the line of 70. But we have not heard of any of this race being found so well adapted as to be regularly productive in any general locality as far down as this last named limit.

This race was brought from Persia to Italy during the reign of the Emperor Claudius. It was introduced into Great Britain about 1550, and to the American colonies about 1680. They are all late bloomers, and cannot carry their foliage through the growing season of the Southern portion of the belt in which they are cultivated. This race includes the varieties usually propagated by the Northern nurserymen and composes the bulk of the Northern orchards.

We have found the following varieties among those best adapted to the Southern portion of the zone of this race. Except in river bottoms, in the immediate vicinity of a body of water sufficient to relieve to some extent the aridity of our atmosphere, even partial success must not be expected with this list on or below the isotherm of 70.

Our nurseries are about in this line, and these varieties are not profitable here. We confidently send these varieties Northward, especially to positions three or four hundred feet higher than we are. But we always regret to have orders for them to

go Southward, except to one whom we know has a favorable position for them. We have varieties that at our premises are practically worthless, and yet are a fair success only a short distance above us. We are upon a line where a few miles North or South make an important difference. We are bringing these questions nearer to a point every year.

PERSIAN LIST OF PEACHES.

Prices—30 cents each; \$3 per dozen; \$20 per hundred.

Alexander—Above medium, highly colored in clay soils, less colored in light soils; flesh greenish white, very juicy, adheres to the seed. Maturity May 9th to 20th. The earliest variety in cultivation.

Amelia—Very large, conical, white, nearly covered with crimson; juicy, sweet, of high flavor. Too tender for market but splendid for home use.

Beatrice—Small to medium; deep red; good quality; matures immediately after Alexander, May 20.

Bexar—Very large; white; red cheek; looks very much like Old Mixon Free, but is three weeks later. A seedling from San Antonio, Texas.

Elmira—Large, white, bright red cheek. A real beauty about July 10th.

Louise—Medium; larger than Beatrice; excellent for home use; too tender for shipment. Ripens just after Beatrice.

Lady Farham—Large; green, with dull red cheek; very good. Last of October and first half of November.

Large September—Large, white, red blush. Reminds one of Old Mixon Free, but ripens in September. This is, no doubt, an old variety that has come to us without a name. Freestone.

Old Mixon Free—Large; white, with red cheek; juicy; excellent. July 10 to 15.

Old Mixon Cling—Large; white, mottled with red. An old peach of superior value. July 15th to 20th.

Picquet's Late—Large; yellow, red blush; flesh yellow; excellent. August 15th. Freestone.

Rivers—Large; pale straw color; very juicy; of the best quality; too tender for market; ripens just after Louise.

Tillotson—Medium; white, nearly covered with red; excellent; good market variety. June 10th. Freestone.

THE NORTHERN CHINESE race occupies the lower portion of the range belonging to the Persian race, and some varieties succeed below it. In our own region, on the line of 70, one or two varieties only are really valuable. This class produces such very large peaches that it is to be regretted that it does not occupy a wider belt of country.

NORTHERN CHINESE LIST OF PEACHES.

Prices—30 cents each; \$3.00 per dozen; \$20.00 per hundred, except where otherwise stated.

Albert Sidney—Medium to large, oblong, yellowish white, with red cheek; flesh melting, and of the highest flavor. Middle of July.

Bernice—Large, yellow, mottled with dark crimson; flesh yellow, melting, juicy, excellent. Freestone. July 10th.

Chinese Cling—Very large and beautiful, but not as good quality as several of its seedlings. July 15th. Useless in the coast range.

Carpenter's Cling—Large, white, sometimes marbled with carmine, sweet, juicy. Originated by Mr. Carpenter of Mountain City, Texas, July 15. This variety bears well about half of the time in the coast country, and is so fine that it ought to be planted here.

Gen. Lee—Above medium, oblong, creamy white with carmine wash; flesh finely grained, melting, very juicy and of high flavor; quality best. July 1st. Cling.

Juno—Very large, deep yellow, mottled orange crimson; flesh yellow, fine grained, excellent sub-acid. Clingstone. August 1st. The Bernice, Juno, Oriole, and Sylphide originated with Dr. L. E. Berkman of Georgia.

Oriole—Large yellow, rich, buttery, excellent. Freestone. August 1st.

Spottswood—Similar to Chinese Cling. Very large, and of best quality. July 5th to 10th.

Sylphide—Similar to Chinese Cling, but a month later.

Stonewall—Almost similar to Gen. Lee, but about a week later, and tree a more upright grower. July 7th to 10th.

Thurber—Large to very large, skin white, with light crimson mottlings, juicy, delicate aroma, good enough for anybody. Originated by Dr. Berkman, and first disseminated by P. J. Berkman in 1873. Freestones bear in the coast country better than most of this class, but not here reliable in most places.

THE SPANISH RACE occupies, probably we may say, the entire range of the Northern Chinese race, and extends considerably Southward of it, the greater portion of the range of the *Southern* Chinese race being included in its proper habitation.

Prior to the introduction of the Chinese varieties, it seemed to be the only class of peaches that could be made a paying success here and below us. This race still comprises the bulk of the orchards in and near the isotherm of 70. It seems to do better a little above this line than below it. Its introduction into our horticulture was the really practical beginning of Southern Texas peach culture.

And now we think that in getting the new seedlings of Mr. Taber of Florida, we have additions to this list that will vastly increase its value.

SPANISH LIST OF PEACHES.

Prices—40 cents each; \$4 per dozen; \$25 per 100; except where otherwise noted.

Bonito—Medium to large; yellow with beautiful carmine wash; flesh yellow with red near seed, very firm; takes a high color long before really ripe; stands shipment well; a very beautiful fruit, but not of first quality.

Cabler's Indian—Large, closely resembles Flewellen; purple, flesh containing deeper purple veins, sub-acid, decided Indian type, a good market peach. July 20th. Clingstone,

Countess—A new peach from Mr. G. L. Taber of Florida. Described by him as nearly round, large to very large; skin white; flesh white, tender, melting, juicy, vinous; quality excellent. Freestone. Will probably ripen here about July 5th to 10th. In dormant bud this year 50 cents each, after planting season of 1888-9 trees at 50 cents each.

- Dowling's June**—Another of Mr. Taber's seedlings. Medium to large, quite red, sub-acid. Clingstone. June.
- Elma**—One of Mr. Taber's peaches. Strongly resembling Old Mixon cling. Will probably ripen here about July 15th to 20th. Clingstone.
- Galveston**—Large, white, juicy, tender for shipment, but fills a place for those who prefer a white freestone for home use. July 25th to August 10th.
- Gaudalupe**—Large, white, sub-acid, good. August. Clingstone.
- Lula**—Large, yellow; flesh yellow. About August 1. Freestone.
- Lilard's October**—Large, white, red cheek, fair flavor; bearing qualities not tested on the coast, will be likely to be found productive in this country. Obtained from Mr. Lilard at Seguin, Texas.
- La Magnifique**—Another of Mr. Taber's Florida seedlings. Tree strong grower, good bearer; fruit large, oblong; skin creamy white, washed with red; flesh firm, rich, sub-acid. Clingstone. Will probably ripen here about July 20th to August 1st. *Dormant buds 50 cents each, for planting season of 1888-9; afterwards 50 cents per tree.*
- La Reine**—A Florida seedling from Mr. Taber. Very large, slightly oblong; skin yellowish white, washed with red; flesh yellowish white, very red at the seed, firm, juicy, delicious. Will probably ripen here about July 10th to 15th. Clingstone. During the planting season of 1888-9, *50 cents each*; afterwards same as other varieties of this list.
- Maggie Burt**—Yellow clingstone with carmine cheek; a strong grower, good size. July 20th.
- Onderdonk's Favorite**—Large; skin and flesh yellow; very juicy and sweet; the best combination of quality, appearance and productiveness. Decidedly our favorite. July. Freestone. *Price, 50 cents each: \$5 per dozen, when ordered alone.*
- Orman**—Large, round, yellow, with carmine wash. A rare beauty. Originated by Mr. Orman at Concrete, Dewitt county, Texas. September 1st. Clingstone.
- Rose**—Medium, round, rosy red, firm flesh, rich, juicy and sweet. June 25th. Freestone.
- Rupley's Cling**—Large, clear yellow, sometimes with a slight blush. The fruit was not large on our young trees, but as the trees attain age this variety excites the admiration of all who see it. July 20.
- Sander's Cling**—Large, bright yellow, very good. July 25th to August 1st.
- Texas**—Medium to large; dim green, shaded with red. Good freestone. Late in July.
- Taber's No. 13**—Very large; yellow washed with carmine. We will have it in dormant bud during the winter 1888-9, *at 50 cents each*; afterwards trees at same rate as given at the head of this list. Clingstone.
- Taber's No. 5**—Resembles Lemon Cling and is therefore a showy peach. *50 cents each in dormant bud during winter of 1888-9.*
- Victoria**—Another of Taber's seedlings. Large, slightly oblong, creamy white, juicy, well flavored. About August 1st. Freestone. *50 cents for dormant buds in winter of 1888-9.*

THE SOUTHERN CHINESE RACE

Will probably be found successful in about all of the Southern third of the area properly covered by the Northern Chinese race, and extends a little below, or down to, the lower borders of the regions of the Spanish race. It is most valuable below the line of greatest success of the Spanish race. The breadth from North to South,

of the proper home of this race will probably be found to be a narrow one. But on the isothermal line of 70 it is surely the most successful class of peaches known to horticulture.

Aside from the possibilities of obtaining a variety of the PEEN TO RACE that does not bloom too early on our line the Southern Chinese seems to be the material from which to expect to obtain *our extra early* varieties that are yet to be originated, to fill a place here similar to that occupied by the Alexander in the regions of success with the Persian race.

It is only about sixteen years since we began to become acquainted here with this race of peaches. During this brief period its season of ripening has been extended in earlier and later varieties, about a month, and even this improvement has all been made within the last five years. If we shall meet with as good success during the years to come that we have had during the last half decade, then we shall yet, in one or more members of this race attain a degree of earliness never yet suggested by the wildest dreams.

There are now numerous choice varieties of this race. But our object is not to multiply varieties, but to secure a succession from the earliest varieties possible, to better fill the season between our earliest and the old varieties of July. Therefore, we present only the five varieties that we have selected as best suited to that object.

LIST OF SOUTHERN CHINESE PEACHES.

Prices given relate to delivery at the Nursery.

Early China—Very clearly resembling Henry in fruit, but ripens seven to ten days earlier. The tree is of stronger growth and attains a greater size than Honey. Price, 75 cents each, \$8 per dozen.

Honey—This peach was originated by Charles Downing, from seed obtained from China. The original tree never fruited, but a budded tree was given to the late Henry Lyons, Esq., of Columbia, S. C., about 1855. The variety was placed in the hands of Mr. P. J. Berkman, of Augusta, Ga., and the only stock held by him until 1858, when it was sent out for the first time. The variety was not found to be valuable at Augusta, but when it was sent to Florida and Texas, into its natural and proper home, it was found to possess special merit. We obtained our original stock from Mr. Berkman. Medium, oblong, with sharp recurved points, creamy white, washed with carmine; flesh of a peculiarly fine texture and a honey sweetness. June 5th to 20th. Price, 50 cents each, \$5 per dozen.

Pallas—Originated by Mr. Berkman's. A seedling of the Honey. About same size as Honey or perhaps some larger, but more round in form. Flesh white, melting, with a rich vinous aroma, partaking in this the flavor of the Gross Mignonne. Ripens after Honey, but exact season not settled yet for this region as we have ripened it only twice. Price, 50 cents each.

Coleman—Originated by Thos. Coleman, near Rockport, Texas, and is given by him a description similar to that we have given of Pallas. Price, 50 cents in dormant bud during the winter of 1888-9, the same as Honey afterward.

Climax—Is larger than Honey; round, slightly oblong, with less recurved point than Honey; color pale yellow, washed with red; flesh yellowish white, fine grained, melting, sprightly, with a distinct trace of acid lacking in the Honey; quality good. Freestone. Ripens just after Honey. Price, 50 cents each; \$5 per dozen.

THE PEEN TO RACE

Occupies the extreme Southern portion of the Southern Chinese range, and extends still below it, where no other peaches are known to exist. We do not doubt its capacity to thrive in a tropical climate, side by side with the banana, the pine apple, the cocoa nut, and citrous fruits of the tropics.

Writers have spoken of it as a "*strain*" of the Southern Chinese race. But the points of difference are so very striking, and its character so fixed as revealed by the character of its seedlings, that we believe it should not be denied the position given it by nature as a distinct *race*. While we do not like to multiply distinctions, yet we have always found it to be up-hill work to contend against the decisions of nature. While we have here, on the line of 70, produced some good crops of the Peen To, yet we have generally failed with it, and our hopes concerning its value for this region are relinquished, unless we can obtain a variety that blooms later than any Peen To that we have yet heard of.

There are numerous seedlings of this class, but with the past history of our experience with the race in this region, we believe we are too much subject to polar influences to allow us to recommend the *Peen To* upon our line, and our trade far below us in the regions where it properly belongs is yet so light that we propagate but few trees of this class, and present only two varieties.

PEEN TO LIST OF PEACHES.

Peen To—Resembles in form a large flat tomato, both ends being flattened, and the pit also partaking of the same form; greenish white, washed with carmine on the sunny side; when fully ripe is of a delicate waxen yellow; flesh pale yellow, sweet, juicy, and of fine flavor. Clingstone. Stone very small. Ripens here sometimes as early as May 25th. The fruit here has generally some bitterness near the skin which it does not possess in its proper home. This peach is a great favorite in Florida among the oranges. Price, 50 cents each, \$5 per dozen.

Bidwell's Early—Originated in Florida by Mr. Bidwell of Olando. Roundish oblong; size medium; skin creamy white, washed with carmine; flesh fine grained, juicy, sweet. Clingstone. Maturity about the same as Peen To.

PLUMS.

No variety of European plums has succeeded in Southern Texas. Yet the Chickasaw and other Southern types have given us a good collection of choice varieties extending from the first of May to September. Some hybrids between the Chickasaw and European families have proven valuable in the Northern and interior portions of the State, but when brought to our coast region they have proven to be destitute of good bearing qualities. But when we attain a degree of hybridization in which the *Prunus Europea* is sufficiently dominant to overcome the disposition to sucker, and impart size and comeliness to the tree—and at the same time the *Prunus Chickasa* is sufficiently present to secure fruitfulness—then we have gained a point, in principle and in fact, for the plum culture of the extreme South that will prove truly a vast beginning. We believe that in the MARIANA, from Mr. Ely, we have a variety that attains to this combination. In our own grounds we have other varieties, of the same general origin, waiting more thorough tests before dissemination. Here is a new development in plum culture that promises vast results.

We have devoted a few acres to experiments with the plum. We have originated about four hundred varieties during our experience. The tests of time have established the value of several of these new varieties. Also, our collection has been enriched by valuable additions from other sources until we are willing to say that we have secured an excellent list of plums for the *extreme* South.

We shall continue to be extremely cautious about recommending varieties that will not merit public favor.

OUR LIST OF AMERICAN PLUMS.

(IN ORDER OF RIPENING.)

Price of Trees at the Nursery, 50 cents each, \$4 per dozen. If delivered elsewhere we make a charge to cover cost and risk of shipment. Special rates for special selections and special sizes.

Early Red—Medium, round, pale carmine, usually ripens first week in May, sometimes in April. The earliest plum in our collection for Southern Texas. In Northern Texas Caddo Chief seems to precede it a little.

ddo Chief—Medium, oblong, red. Ripens about four days after Early Red here. A surer bearer than Early Red, but not of as good quality.

Munson—A new variety from our own grounds and now offered for the first time. Large, oblong, vermilion red, as large as Wild Goose, and about two weeks earlier. Tree of a low spreading habit, and a good bearer.

Jennie Lucas—Large, clear bright yellow, good flavor.

Piram—Large, round, pale green. Originated by P. T. Hall, formerly of Golied County, Texas. A very heavy bearer.

Mariana—Large, round, red, sweet; bears mostly on old spurs. Tree a very fine grower, never suckers, makes a good shade tree, and should take the place of Umbrella China in many instances.

Coletta—Large, slightly oblong, pale carmine, sweet; a showy fruit. Tree has upright habit, is a heavy biennial bearer.

African—Large, round; russet with blush when ripening; dark flesh colored red when ripe; a sprightly sweet. About June 1st.

Wild Goose—Large, oblong, ripens from pale yellow to vermilion; ripens with African. About June 1st. There is much complaint in Southern Texas about its bearing habits. There are some trees in this region that bear enormously, and yet we have seen that the complaints against its bearing habits in this region generally are well founded.

Saffold—Large, round, red, decidedly acid; much valued for preserves. Tree a spreading open grower, bears well.

Clara—Somewhat larger than Saffold, of the same general character, but a trifle later. Named in honor of Miss Clara Davidson of Mission Valley, Texas, whose father has presented us with a seedling plum bearing a close resemblance to this variety.

Indian Chief—Large, round, red, sub-acid; flesh a little mealy; bears well at an extremely early age. Tree has an open habit, and, we think, is more subject to effects of extremes of wet and dry than most varieties. Very popular.

Beaty—Medium, round, red, sweet; very productive; ripens in succession, extending over more time than is usual with plums. Keeps remarkably well after gathering, and has the best possible shipping qualities.

Newman—An old variety of good standing. Medium, oblong, red, sweet. bear acquaintance well. July 20th to 25th here.

Kanawha—Medium, ripens from yellow to vermillion. August here. This variety, with the *Golden Beauty*, seem to belong to a new native type hitherto undescribed, but now being investigated by Prof. Munson.

Golden Beauty—We obtained this variety by cuttings from a wild tree near Fort Belnap at the close of the war between the states. We were so pleased with the appearance of the tree in full bearing that we named it *Golden Beauty*. Fruit yellow, quite handsome when thoroughly ripe, flesh firm, seed small, a choice variety for preserves. Ripens here August 15th to 25th.

ORIENTAL PLUMS.

American pomology is being vastly enriched by introductions from the Orient. In plum culture, we of the extreme South, have hitherto been confined to varieties of our own native races. But there has now come to us a hardy race from Japan, that seems destined to bear an important part in giving variety and enlargement to our supply of plums. The best tested of this group is the *Kelsey*. That it is productive both above and below our isothermal line and line of latitude is well determined. Then it remains to a certainty that it will prove successful here also.

The growth of the young trees here is all that could be desired. It is bearing well at Houston. At our nurseries we are having the first products this year. At this writing, July 6, we have just measured a specimen about six inches in circumference. It has probably yet six weeks to grow before maturity, so that it is easy to believe that it will reach a circumference of eight or nine inches.

To have a plum that can be readily peeled with a knife, as one would do a peach may seem extravagant, but it is just what we have in some of these Japan plums. We have eight varieties growing in our grounds at the nurseries. We shall be ready to supply any or all of them in the fall of 1889. We can supply them in dormant bud this season at 50 cents each, or \$5 per dozen, on Mariana stocks.

Kelsey—Very large, sometimes reaching a circumference of nine inches. Dark brown yellow, with blush of pale red; sweet, flesh as firm as an apple; seeds not larger than we usually find in our small varieties. Season of maturity here about August 25th. Three an upright grower, but does not probably attain a great size. 50 cents to \$1, according to grade of tree.

Ogan—Botan—Chabot—Mason—Long-fruited—All are said to have the same general character as *Kelsey*, with variations of color and season.

Botankie—Is said to mature earlier, but we have not fruited it.

Virgata—A beautiful ornamental tree, blooming very early, showing a profusion of rose colored double flowers. If the late frost does not prevent it bears a good crop of small, oblong, orange yellow plum of an apricot flavor.

Prunus Pissardii—This variety comes from Persia. The leaves are highly colored with a combination of purple and red, and maintain this color all through the season. This renders it a showy tree for the yard or garden. It fills the same place among flowering trees and shrubs as colored foliage plants do in the conservatory or flower garden. The fruit is large, bright red, fair quality, and ripens here this year in the second week of May. 50 cents to \$1.

Prunus Simonii—A new fruit introduced from China. It is not known whether it will prove successful here. We have had it two years, 1887 and 1888 cover two years of our utmost extremes, and yet the trees seem to be doing well. We are trying it ourselves, and offer it to those who want to test its value here. Tree of medium height, upright habit, leaves deeply veined, but otherwise somewhat between those of peach and plum. The fruit is said to resemble a flattish, smooth,

brick red tomato. The flesh has an apricot yellow color, firm, and with a peculiar aromatic flavor. It is like no other fruit with which we are acquainted. If it succeeds here it will probably mature here about last of June or first of July. 50 cents to \$1 each.

APPLES.

A few years ago we had no faith in Apples for Western Texas; but we have watched eagerly every experiment bearing upon the question, until our sense of encouragement has ripened into a good degree of confidence. We find that in this region our young apple trees grow off with astonishing rapidity. After two or three years our standard trees assume a dwarf habit. They grow as large as a dwarf pear tree, and some varieties bear well. Out of about eighty varieties tested in our experimental orchards a few varieties have been found so far adapted as to be worthy of cultivation here. We raise altogether standard trees, as we find no artificial dwarfs to be valuable. As we ascend toward the interior, we find the apple does better than here. There is one general misapprehension about the apple which we wish to see corrected. It is often said that this country is "too dry" for the apple. Now, the apple and pear will bear more drought than the peach. I have not yet seen a season so dry as to seem to injure my apple or pear trees, or injure the fruit. But apples must have good soil and good cultivation.

LIST OF APPLES.

Prices of trees, 40 cents each; \$4.00 per dozen; \$20.00 per 100.

Red May—Medium, nearly covered with red; ripens with us about last of May and early in June.

Harvest—Medium, yellow; follows Red May in time of ripening.

Summer Queen—Large, yellow, with rich strips of carmine; ripens in June.

Stevens—Medium to small, flat, well covered with red; flavor good; originated with Mr. Stevens at Gonzales. Ripens with Summer Queen.

Yellow Sweet—Large, yellow; a good bearer and the only sweet apple that has done well enough to seem valuable to our culture; follows Stevens and Summer Queen.

Red Astrachan—Large, Red; is less reliable here than the other varieties; a fine apple; tree bears young; ripens in June.

Jones' Favorite—A straggling grower, but good bearer; medium to large, oblong, green, good flavor; ripens in August.

Lincoln—Large, flatish; while growing resembles Rhode Island Greening, but takes a dull blush just before ripening. Our best apple, August.

Sally Gray—Medium size; red on one side; flat, juicy, subacid; tree vigorous but does not bear as young as the other varieties. August and September.

Ben Davis—A large, handsome, striped apple of fine quality. Tree very vigorous and productive; a fine keeper, highly esteemed but not well tested here; bears well 100 miles above us.

Shockly—A late variety, generally considered valuable at the South; fruit medium to small, roundish, conical, pale yellow; keeps remarkably well. We hope we have a good thing in the Shockly, but do not know it.

Transcendent Crab—Valued altogether for preserving.

PEARS.

Our experience and observations concerning the pear have convinced us that if the proper varieties are selected it is well worth our care and attention to plant pear trees.

We have planted in orchard rows about seventy varieties and awaited results. At the end of fifteen years we have settled upon a few varieties that seem adapted to our soils and climate. Altogether our close study of the pear for Southern Texas extends over only a period of about twenty years. At first we had no faith in pear culture for our section. But after our results we should be dull indeed if we did not believe in planting pear trees on every premises that has a suitable situation.

At first we were impressed with an idea that dwarf pear trees would prove most promising. But our experience has reversed our judgment. We now declare decidedly in favor of *Standard* trees as a final dependence for fruit. However, we favor the planting of dwarfs for a quick supply till the standards can have time to come to bearing.

We supply both standard and dwarf trees. Dwarf trees are simply those raised on quince stocks. They bear soon and die early.

Standard trees are raised upon pear roots. They root very deep, defying the driest season when once established. Both standard and dwarf bear drought well. Both insist upon clay at some accessible depth. The roots of the standard will run down to a great depth, reaching to a distance of thirty feet or more in good clay.

We would plant standards twenty feet each way, and then plant dwarfs between each two standards, so that every other row would all be dwarf and the remaining ones half standard and half of them dwarf trees. Our preference for standard trees is gaining ground every year.

Dwarf trees may be planted so that the joint with the quince will be from three to six inches below the surface of the ground. They will start more slowly, but will finally become half standard, and consequently longer lived. Standard trees should be planted at the same depth they stood in the nursery. Pear trees must be expected to grow off slowly at first for two or three years. Dwarf and standard trees will be sold at the same price.

No section has a long list of really successful pears. While the entire list of pears in cultivation embraces some fifteen hundred or more varieties, yet only a very few sorts succeed thoroughly in any one region. We have reduced our list to such as seem most promising here. We have not yet seen a case of pear blight in Southern Texas.

Price of Trees—50 cents each; \$5.00 per dozen at the nurseries, except where otherwise stated. If delivered elsewhere we make a charge to cover cost and risk of delivery. *Special assortments and special sizes special rates.*

LIST OF PEARS.

Andrews—Slow grower, scrubby habit, but finally bears well. Medium size, very rich; succeeds both as dwarf and standard. One of our good pears. July 20th.
Beurre Bosc—Long, fleshy stem, good quality; one of our best bearers. July.
Belle Lucrative—Large, delicious; comes slowly into bearing; best as standard.
Bartlett—Large, rich; popular everywhere; very good here as a dwarf—better as a standard. August.

Duchesse d'Angouleme—Our largest good pear, excellent quality; bears well here; best as dwarf.

Kieffer—A seedling of the Chinese sand pear. A very strong grower; very promising but not thoroughly tested here.

Le Conte—A seedling of the Chinese sand. The most vigorous grower we have seen. Its bearing habits exceed any other variety. Our oldest Le Conte tree is now a sight worth taking pains to see. It was planted eight years ago and has now an astonishing crop. But we think it must be conceded that the Le Conte is a sand pear, as it seems to do very much the best in a sandy soil. From what we have seen of this variety we intend to increase our planting in orchard rows. In quality Le Conte is about as good as the Bartlett is here, conceding that our Bartletts are not as good as at the North.

QUINCES.

When properly treated the quince does well here. Nothing turns up its nose quicker at a poor soil than the quince. Plant in rich soil, apply a little salt on the surface of the ground each year. The Apple or Orange quince is well tested here. Price 50 cents.

MULBERRIES.

Texas is a part of the natural home of the Mulberry. We can scarcely mention a variety of soil in which the Mulberry, in its numerous varieties, does not thrive well. While our native wild varieties are of good quality, yet they ripen through such a very brief season that it is welcome to have varieties that continue through a longer period. We believe we are on the eve of marked improvements in the Mulberry. The introduction of the Russian type is a matter of importance to the American people. Although it is true that in planting what nurserymen now offer as simply "*Russian Mulberry*" trees, the purchaser cannot have any possible intimation whether the fruit on his trees will be white, black or red; large, small or medium, because they are all seedlings, yet he *may* know that he is getting something that will grow rapidly, and if properly pruned up will make a fine thrifty tree. It remains to develop from this hardy race a list of valuable varieties of special merit. We are trying to see what we can do towards developing good varieties from the Russian type, and we expect in time to present a good collection.

We are led to believe that in situations where they can be cultivated for three or four years after planting, the seedling Russian Mulberry is a valuable tree to plant to serve as posts to a wire fence. It has the merit of standing almost any wind that ever blows. During the cyclone of 1886 not one of our Russian Mulberry trees were injured. We have trees planted four years ago that were large enough a year ago to serve as posts to a wire fence. We do not know how durable the timber would prove when set in the ground as posts. Our proposition is to use the growing tree as it stands.

LIST OF MULBERRIES.

English—We find this variety here, pleasing everybody who has it. We do not know whether this is its proper name. We doubt it. But it is the name by which our people know it. Tree a round spreading head, makes a fair shade

tree. Berries large, long, acid, continues ripening for several weeks, and sometimes also makes a Fall crop. 50 cents each, \$5 per dozen.

Rives—A very fine rapid growing *shade tree*. The fruit, while being good, has not special merit. The value of this variety consists in its capacity to make a good shade *quickly*. 50 cents to \$1, according to size.

Russian Mulberry—All seedlings, and may produce fruit of any color or size, or none at all. A quick growing Ornamental Tree. 25 to 50 cents, according to size; \$5 to \$10 per 100, according to size.

Emma—A new seedling, originated upon our premises, and seems to be a cross between the wild mulberry and one of our cultivated sorts. Tree a strong grower, leaves very large; berry large, sub-acid, has an extended season of ripening. \$1.

Victoria—One of our new varieties developed from the Russian type. A tall upright grower, very rapid growth; a great favorite on our premises. Berry large, sweet, black, ripens for several weeks. \$1 each, \$8 per dozen.



GRAPES.

Many of our people have planted grapes and have failed. Some have deserved and experienced failures, because they have not taken care of their vines. But others have *failed because they planted varieties not suited to the climate*. We have spared neither attention nor expense to make our experience with Grapes as valuable as possible. We have been cultivating the Grape for thirty years on our present premises. We are pleased with the progress that we have made in ascertaining the adaptability of varieties to our climate. As it takes several years to properly test some varieties, we must expect slow progress in this kind of enterprise. Our experience has led us to adopt some generalization which seem to be correct and are of vast service in selecting for experiment.

Some years ago we planted sixty varieties of grapes in our experimental vineyard. Our collection embraced varieties belonging to every family of grapes then considered worthy of cultivation. The only thoroughly successful varieties in our experiments belong to what was then spoken of as the *Southern Aestivalis* type.

We had temporary success with some *Labruscas* and some *Vinifera* varieties. But, from different causes, we found them unreliable and short lived with us. Further towards the interior, and in special localities where conditions are different from our own, some varieties that failed with us have given good results. But we believe that our results hold as a general guide for the coast region, that they are a less certain guide as we recede from the coast country and gain higher latitudes, greater elevations, and attain different conditions.

Prof. T. V. Munson of Dennison, Texas, is doing valuable service for the future viticulture of Texas. He has many new seedlings which, altogether, include quite every combination from which we hope to secure new varieties with which to improve our collections for *Southern* as well as Northern Texas. Several of these new grapes are now in our experimental vineyard awaiting the test of time before being offered to the public. We may well hope that Mr. Munson's labors will yet enable all Southern Nurserymen to enlarge their list of profitable grapes.

PLANTING THE VINES.

We refer the reader to our chapter on *Selection of ground for orchards*. He should remember that drainage is above every other consideration. Prepare the

ground as thoroughly as for any other crop. Our Southern varieties should be planted not closer than ten or twelve feet apart each way. To prepare the plant shorten the roots to six or eight inches. We cut the tops to within a foot or less of the old wood of the plant.

If the soil is rich enough to produce twenty or twenty-five bushels of corn to the acre it is rich enough for starting a vineyard. *Put no fresh manure* in the neighborhood of the roots. There may be situations having no clay sub-soil in which extra deep holes or deep trenches are an advantage, but deep trenching or deep holes into the clay subsoil has proven, with us, worse than labor thrown away. Many a tree and vine has been killed by this sort of kindness. The hole may be made from nine to eleven inches deep, and then filled to within about from six to eight inches with good moist surface soil. It is best to plant while the earth from the hole is moist and fresh.

Insert the plant so that only one or two buds may be above the surface at the completion of the planting. If, when the plant is held as above directed, it is thereby brought to a leaning position, no harm, but rather advantage will result. Now cover the roots with moist surface soil, and press it well around the roots. Should the soil not be well moist pour some water into the hole before packing the earth. Let it soak away and complete the filling as in other planting.*

The above method of planting secures more or less eyes below the surface of the ground. These will each send out a number of roots, greatly reinforcing those with which the vine is planted, and thus securing a much stronger growth than could be obtained by planting none of the wood of the top.

PRUNING THE GRAPE.

Universal experience teaches that the best results are obtained from the new sprouts which grow from the *strongest shoots of the previous year's growth*. Any system of pruning therefore, to be correct, must encourage a good annual supply of such growth. In this climate, also, every cluster of grapes *must be in the shade*. Aside from the above essentials any peculiarities of any system are mere matters of taste or convenience. We give only one system and refer the reader who wishes to study other methods, as well as gain a large fund of useful information—to Prof. Geo. Husmann's new work, entitled "*American Grape Growing and Wine Making*," sold by Orange Judd & Co., New York. Also, *Illustrated American Grapes*, by Bush and Son and Meissner, Bushberg, Mo.

During the first Summer let the plants grow just as they please—stakes or trellis not being required.

During the Winter after the first year of growth cut away all of the previous year's growth except three eyes. Before the vines start their spring growth the soil should be well cultivated, the plants hoed clean and stakes set along each row to support the wires of the trellis. The lower wire will only be needed during this season and may be placed about eighteen inches from the ground.

During the Spring of the second year a number of shoots will start from the stump of three eyes which was left at the winter pruning. When these shoots are about six or eight inches long, the first *summer pruning* begins by removing all of these shoots except two. These two shoots should be trained to the wire, which is about eighteen inches quite immediately above them, if it has been properly

*See under How to Plant a Tree, page 4.

arranged. These shoots, while young, will be found very tender, and care will be needed not to injure them in handling. We sometimes use light switches set in the ground as supports, tying the tender shoots to them till they reach the wire. We prefer strings made by stripping up the leaves of the Spanish Dagger tree, or *Yucca Gloriosa*, as they will rot off just about the right time. Train these two shoots along the wire in opposite directions. Allow no new shoots from below. Remove all the side shoots from these two main canes for from four to six feet from their base, but do not injure the buds in so doing. Keep the soil well cultivated all summer. These two canes which we call horizontal arms, should each grow to from fifteen to thirty feet during the year, and we have seen them make forty-five feet.

During the Winter after the second year of growth, cut the horizontal arms back to from four to six feet each—the length of the shortened cane to be governed by the growth of the former year. *Always cultivate the soil and hoe the plants before the new growth appears and continue* thorough cultivation through the season. Now add the two remaining wires to complete the trellis. The lower wire having been placed about eighteen inches from the ground—the second one may be from ten to twelve inches from the first. The third or upper wire may be eighteen or twenty inches above the middle one, so that the trellis would consist of three wires, the highest being about four feet from the ground. Some cultivators use four wires, No. 12 wire is the size generally preferred.

During the Spring after the second pruning, which is the third year after planting, we find the plant consisting of two horizontal arms, from four to six or possibly eight feet long—everything else having been cut away. The cultivator may now expect a reasonable crop of grapes. Bind these two arms to the lower wire of the trellis. This should be done before the Spring growth has begun. A sprout will start from each bud of the horizontal arms. Select on the upper side of the arms from five to seven of the strongest bearing shoots and train them as upright canes, binding them to the second wire. Rub off all shoots except those selected as upright canes. If any appear feeble remove the weaker ones. If any buds have made two shoots remove the weakest one. If some are not yet developed, we pass them for the present and go over the vines again in four or five days afterwards. All of the fruit is to be grown on these new shoots. In our treatment of the grape we simply train these shoots to the wires above them and along on the trellis, as this answers the purposes for which we cultivate the vine, and it will be found by most cultivators to best suit their convenience. But for those who desire to make the very largest and finest clusters, and are willing to tax themselves with the additional labor and care to insure that object, we recommend the renewal system.

Summer Pruning.—Near the base of each of the horizontal arms, select a strong shoot, which is to be trained for the purpose of *renewal* at the next winter pruning. This renewal cane, as it grows is to be trained to the upper wire of the trellis.

Next pass over the remaining upright canes and pinch off the terminal bud of each as soon as it reaches two leaves beyond the last bunch of grapes, the embryo clusters of which will appear as the cane grows. Some varieties will show two, others three, and the Herbemont and Lenoir will sometimes show four bunches of fruit on one of these upright canes.

After the upright canes have been stopped as above directed, they will start lateral from the axil of each leaf. The laterals should be promptly stopped by pinching each one off just above the first leaf. The sooner this is done after the lateral passes the development of its first leaf the better. In fact, every operation

of Summer pruning should be performed *as soon as the development of the plant will admit.*

The laterals will start a second time, when we in turn pinch off this new growth to one leaf as before, thus giving to each lateral two leaves. The above stopping of canes and laterals will force a development of fruit by stopping all surplus growth and at the same time supply abundant shade for the growing grapes. The whole course of pruning will here, with our Southern varieties, be completed by the middle of April or a very little later, and whatever grows afterwards during the season may be left to grow at will on the trellis, except that suckers from near the ground must be kept down during the whole season.

During the Winter after the third year of growth we do our third Winter pruning. Of course, we must now be governed by the conditions resulting from the Summer treatment of the preceding year of growth. If we followed the renewal system of Summer pruning we will now see that each vine consists of the two horizontal arms which support the upright fruit canes of the previous year, and the *renewal* canes which we trained to the upper wire of the trellis. There may also be more or less light, straggling shoots that grew after the Summer pruning has been completed.

We now cut away the old horizontal arm of last year just above the renewal cane that was trained to the upper wire, and shorten to from four to eight feet the renewal cane. This may be shortened in proportion to the vigor of the plant, and brought down to supply the place of the old horizontal arm on the lower wire. Remove all straggling shoots that may have escaped amputation, so that the vine shall again consist of only two horizontal arms, trained in opposite direction on the lower wire of the trellis.

But if we have not followed the *renewal system* of summer pruning, our vines will be in a different form and will, of course, require different treatment. In the latter case instead of two strong canes on the upper wire and several short old fruit arms, we will find several upright canes of considerable strength. If we see that one of these canes has very much outgrown all the rest and it comes from near the base of the plant, we cut away all the rest on that side, and make a *renewal* cane of it as in the pruning after the renewal system. But if the canes are of something like equal growth (as they will usually be found to be), then we cut each one back to within four eyes of the old wood. If a cane appears much stronger than the average it might have an eye or two more; or if below an average it may be left with an eye or two less. And if there are a good number of strong canes, say five to seven on a side, then any *very* weak ones could be cut out altogether or at most given a single eye.

From this onward the treatment of each succeeding year is to be a repetition of this year's work. By this time the cultivator will have become acquainted with his vines, and will have acquired sufficient judgment concerning them that he should be competent to manage them successfully.

There are some points in relation to the treatment of the grape to which we will here refer at the risk of some repetition. Whatever system of pruning is adopted the work must be begun *early and pressed promptly*, so rapid is the Spring development that delay is disastrous. Do all stopping of shoots so early that it can be done at the terminals, so that the vine shall be despoiled of little or no foliage, and there shall be no waste by forming useless wood, only to be removed during the growing season. The grape is very sensitive to the loss of foliage during

the season of rapid growth—therefore the idea in summer pruning is *not to destroy foliage or new wood, but to so direct their formation as to economize every energy of the plant and concentrate its power to the production of fruit.* The operator who fails to keep these ends in view had better not summer prune at all.

Again, it must be remembered—and the idea carried through our pruning and binding to the trellis—that while the young fruit may grow well in the sun, yet in this latitude *the grapes must be in the shade at the ripening season.*

Again, *don't cut your vines while the buds are swelling*, as it will cause them to bleed so freely. If you have begun to cut and find them bleeding very much, then wait till a norther has checked the sap and begin again. If no friendly norther comes along to help you out, then wait till some leaves begin to open, and although we deprecate cutting at this stage, yet it is better than to prune when the vines bleed profusely. And yet again, don't cut too early, as then the warm spells of our winter may push out the fruit buds too soon and thus endanger the crop. The middle of our January is the safest medium time for our winter pruning.

OUR LIST OF GRAPES.

We have thrown aside the largest number of varieties which we have been cultivating, because we have not found them adapted to this region. Although many catalogues contain long lists of grapes, yet the list of really profitable varieties in every locality is very short. Large amounts of money are annually squandered in the vain hope of success with a large number of varieties. This is a delusion against which we wish to caution our people. As a large portion of Texas is infested by phylloxera we have taken care that our list should be mostly composed of varieties found to be phylloxera proof. We will supply any variety, whether in our list or not, if *early* application is made.

We are satisfied that the classification of grapes is about to undergo a general revolution, and we shall, therefore, in our descriptions, avoid such descriptive terms as we think will soon become obsolete, and use only such as will remain intelligible.

We shall hasten to add to our list any new varieties that are ready for dissemination, as soon as we have sufficient reason to believe that they will be valuable to our people.

Price of Plants at Nursery—25 cents each; \$2.50 per dozen; \$10.00 per 100, *except in cases where other rates are appended.* Wholesale rates given on application. Special assortments at special rates. *These prices apply in cases only in which delivery is made at the nursery.* If delivered elsewhere we make an additional charge to cover cost of transportation and risk in transit.

LIST.

Black July (Herbemont type)—Medium, black, sweet, seldom shouldered, compact; ripens early in July. We think it a little too far South in the coast region; an excellent table grape. It is a pity that it bears so lightly and fails so young here. It is durable and productive further up the country, nearer the climate of its origin. This variety has been found wild in different places in Georgia and Alabama. It is also known as Deveraux, Sumpter, Lincoln, Sherry, Blue Grape, and at one time was disseminated as Lenoir.

Harwood (Herbemont type)—We obtained this grape from Major Harwood of Gonzales. It seems to have come as a sport from the Herbemont in his garden. The original plant was very productive and vigorous. It does not start well

from cuttings, and is generally raised by grafting. It seems to be somewhat eccentric in habit. In some situations it is simply splendid, in others a flat failure. It seems to do best on mustang stocks. This variety will never become cheap on account of the mode required for propagation. 50 cents each; \$5.00 per dozen.

Louisiana (Herbemont type)—Bunch and berry medium; compact, sweet, gray-purple. Middle of July.

Herbemont—Often known as Warren. Berry medium, dark purple, blue bloom, cluster large, heavily shouldered, compact, very thrifty and productive. Our strongest grower, our best wine grape that has been thoroughly tested, and a good table grape. July 12th to 25th.

Cunningham (Herbemont type)—Bunch small, berry medium; amber or pale red, and, like all of Herbemont type, has little pulp.

Lenoir (Herbemont type)—Berry medium, black, round, no pulp, vinous and *very much coloring matter*; bunch large, long, compact, generally shouldered; leaves deeply lobed. This variety does not bear quite as young as the Herbemont. It is cultivated in different parts of the state under the names of *Black Spanish*, *El Paso*, *Burgundy* and *Jacques*. It has also been confounded with the Ohio or Cigar Box; but having obtained from Mr. Campbell a plant of the latter, we can testify that these varieties are very distinct. In France it is cultivated under the name of Jacques. It is there much demanded both on account of the very deep color of its wine and its capacity to resist the phylloxera, which are so rapidly destroying the vineyards of that country—and with others of its class will be useful in reconstructing the vineyards of California. The Lenoir and Herbemont are, without doubt, the two best vineyard grapes for Southern Texas that have yet come largely into cultivation.

Medora—A new seedling from Lenoir crossed by us upon Croton. We have long been trying to procure a variety of the Herbemont type that should fill the want of this section for a phylloxera-proof *white* grape. We think we have it in the Medora. We now offer it to the public for the first time. Time must prove whether this grape will please our people. Berry medium, cluster small-shouldered; white with white bloom; sometimes shows veins of purple on sunny side; very sweet. Foliage resembles Lenoir. We gave the seed producing this grape to Dr. Thos. Cocke of Victoria, Texas, who brought the vine to bearing. We named the variety after his daughter, now Mrs. Taylor of this county. Should the Medora not fill the position for which it has been originated we hope for an equivalent from among the white varieties of the same type originated by Prof. Munson. Price \$1.00, mailed to any address or delivered at nursery.

Sweet Water (*of the European type V. Vinifera*)—Large, round, sweet, fleshy pulp, large clusters; has long been cultivated in Southern Texas as *Malaga*. A very fine table grape. Its value for us is much impaired by the fact that the vine, like all of its class, is subject to be destroyed by phylloxera, and therefore it is very short lived in Southern Texas generally. At points where phylloxera has not yet infested the grape it is a very vigorous grower. In the loose sands of the coast where it is presumed phylloxera cannot work this variety will probably always be in demand. But at such points as Galveston where other soils have been introduced in filling low sites, these varieties will probably uniformly fail. This variety is also subject to rot badly in unfavorable seasons. But it is so good when you *do* succeed with it that it is still demanded by our customers. We understand it to be a seedling of Malaga.

Malaga (*V. Vinifera*)—We got our start of true Malaga from California. The vines come into first bearing here this year. The fruit is lost by rot during this very rainy season. Berry large, pear-shaped, sweet, white, bunches very large; a splendid table grape. We don't claim to know how it will finally turn out here. We are *trying it* and offer it to others who want to see what they can do with it.

MISCELLANEOUS FRUITS.

Prices given are for trees at the nursery.

Almonds—The Peach Almond is hardy and productive here. It is, however, an inferior variety. Of the fine varieties, the *Princess* is the most promising. While the almond will likely prove of value in the higher portions of the state, yet the best varieties have not been successful with us. Price of trees 50 cents each; \$5.00 per dozen.

Raspberries have promised just enough to induce perseverance with them, but never really successful. We have abandoned their culture.

Blackberries—We have repeatedly tried the fine varieties cultivated at the North and East. They have flattered us for a couple of years and then failed. We have finally tried a variety originating on the premises of Mr. Braden in Colorado County, Texas. It seems to be a cross between the wild Blackberry of Eastern Texas and the Texas Dewberry. It is doing so well with us that we are pleased with it and are disseminating it among our customers. We call it *Braden's Blackberry*. Price, \$3 per dozen; \$20 per 100.

Dewberries—Texas is the most natural home of the Dewberry. We consider them better than any Blackberry we ever knew. We have both *white* and black varieties. Price, \$3 per dozen; \$10 per 100.

Currants and Gooseberries with us have never survived the first season.

Cherries—We have tried many varieties of cherries. We have totally failed. We have no cherry trees for sale, but if ordered from us early will get them from the best Southern sources for our customers. 50 cents each; \$5 per dozen.

Jujube—A fruit somewhat between a plum and a date. Foliage ornamental, hardy and vigorous here—*suckers badly*. We plant it for ornament and for our bees. 50 cents each; \$4 per dozen.

Pomegranates—Sweet and sour. 40 cents each.

Japan Persimmon—We planted trees of this fruit in 1878. They are thrifty and productive. We believe this fruit will prove an acquisition to Southern Texas. The fruit of our trees have all been seedless. Some samples measured nine inches in circumference. While the trees do well, yet there are obstacles to the propagation of young trees here that will keep the price unreasonably high for some time. Present price of trees, \$1 each.

ORNAMENTAL DEPARTMENT.

In the Pomological Department of Horticulture we have been compelled to advance step by step, by the accumulating light of experience and observation in a country where we had but few precedents to guide us. In the Ornamental Department we have had to contend with obstacles less formidable. But careful ex-

periments and active observation enable us to glean here and there a gem. The love of flowers has induced many of our people to plant their favorites about their homes. Numberless experiments are thus made in this interesting field by those who have no public object in view; but they, nevertheless, unconsciously aid in the improvement of Texas floriculture. In our study we have combined these developments with our own experience to no small advantage. We do not claim that everything possible has been done in the Ornamental Department of Texas Horticulture, but we are highly encouraged by the collective results that have been attained. When we think of the grand army of experimenters in Texas, some of whom have public, and many of whom have only private objects in view; and when we consider the richness and value of our Southern floral wealth, we are led to look for a vast degree of development in the future. We are fast learning what trees, plants and flowers are suited to our region. We at first gave our whole attention to the subject of fruit culture. More recently we have been among the flowers. We well know that we have much to do to place this department of our establishment where it will meet the future demands of our patrons. But we shall spare no effort of which we are capable to keep pace with the increasing wants of our people.

We annually improve and extend our ornamental lists by importations. When, from year to year, we bring out new plants, we can easily bring as many more as are required by our customers. We will, therefore, accept orders for *anything desired* by our patrons that our list does not contain, provided, that such orders are forwarded in time to enable us to include them in our own importations, which will be made in November.

DECIDUOUS TREES, SHRUBS AND VINES.

We have rejected from our list all such as have been found unsuited to our climate. Many trees and shrubs of decided value at the North are often called for and *not supplied* because if our customers *must* fail with them we prefer to have them fail with stock from *some other nursery*.

It will be observed that we have added to our list two novelties that have not before been presented to the public in any catalogue, viz.: Ceniza and White Flowering Willow. We have given the common names because we think they will be best recognized by the majority of our customers.

DECIDUOUS LIST.

Prices all relate to delivery at the nursery. If delivered elsewhere we charge sufficient to cover cost and risk of transportation.

Althea (Rose of Sharon).—Shrub attaining 6 to 8 feet. Bears large flowers, continuing to bloom from May to October: double white, pink, purple, variegated.

We have no single variety. 40 cents.

Box Elder—A rapid growing, native shade tree; attains the height of from 20 to 30 feet. 50 cents.

Crape Myrtle (*Lagerstrœmia*)—Shrub attaining here 10 to 15 feet, perhaps should be called a tree. Bears exceedingly delicately fringed flowers in great profusion from May to October: hardy here; pink, purple and scarlet. 40 cents.

Crape Myrtle—White; of same family as above, not quite so hardy, more dwarf in habit, an abundant bloomer all summer; pure white. 50 cents.

Catalpa—Western Catalpa. 50 cents.

Chinese Evergreen (Hollii)—and Belgian (Lonicera Belgica) 40 cents.

Flowering Pomegranate—Blooms freely in Spring; double flowers; two varieties, variegated and scarlet. 50 cents.

Flowering Willow (Chilopsis)—Purple. Native of West Texas; bears a profusion of bell shaped purple flowers; curious and beautiful; blooms from March to October.

Flowering Willow, white—A new variety, now for the first time introduced to the public. It was found by Dr. Atlee of Laredo, Texas in the sand of the Rio Grande near the seminary at Laredo. We obtained it from him, and now have a few plants for sale. It will be considered very beautiful by all who see it. The foliage is of a paler green than the purple which we began to disseminate when we first started our nursery in 1870. Price of plants, \$1 each.

Honeysuckle (Lonicera)—Red Trumpet.

Japan Quince (Pyrus Japonica)—Bears red flowers early in the Spring. 50 cents.

Japan Quince (Pyrus Manlei)—Blooms freely in the Spring, blooms not so bright as the above, but produces considerable crops of fruit. 50 cents.

Lombardy Poplar—A tall, fine growing habit, much fancied by some; a good tree for quick effect, but is short lived here. 50 cents.

Locust (Black Locust)—Too well known to need description. 50 cents for single trees; \$4 per dozen.

Maple (Silver Leaved)—Does well with us as long as we cultivate the soil. Succeeds in moist situations without special care, but fails in dry situations if not cared for. 50 cents each; \$4 per dozen.

Silver Leaf Poplar—Leaves a bluish green on the upper side, a clear dazzling white on the under side of the leaves. When the leaves are stirred by the breeze the tree presents the appearance of being full of large white flowers. Sprouts from the roots and therefore requires to be kept succored. 50 cents.

Smoke Tree (Rhus Cotinus)—A shrub. Bears a fringe of hair like-flowers of smoky color; blooms at intervals all Summer. 50 cents.

Spirea Prunifolia—A low shrub, blooms very freely, bearing a great profusion of small, compact, double white flowers not larger than a shirt button. These grow all along the slender canes of the shrub. It is called Bridal Wreath by many persons. The blooms come about the time of Pyrus Japonica when flowers are scarce and help the appearance of a plot at that season. Later in the season they cease blooming and become inconspicuous. 40 cents.

Spirea Reevesii—This Spirea blooms a trifle later than Prunifolia; bears immense clusters of white open flowers (is also called Bridal Wreath by many) is very sightly during its brief season of blooming and has the merit of being *inconspicuous* after the blooming is over. Every ornamental plot should contain some of this *best of Spireas*. 40 cents.

Umbrella China—Too well known to require description; our most rapid growing shade tree. If customers at a distance order large trees they will not come above quotations given, unless extra sizes are called for, but it must be remembered that large trees of China have enormous roots and will necessitate high expressage. 25 to 50 cents.

Wistaria—Vigorous runner, bears spikes of light blue in early Spring. 50 cents.

EVERGREEN TREES AND SHRUBS.

Arbor Vitæ, Golden—Grows very compact and symmetrical without shearing: takes a yellow tint in Winter; makes a beautiful tree in the yard, or for a country lot. \$1 for one foot, larger trees in proportion.

Arbor Vitæ, Intermedia—A cross between the common Chinese and golden, being less open than Chinese, and less compact than Golden; suits the fancy of some better than either of its parents. \$1 for 1 to 2 feet; larger trees in proportion.

Arbor Vitæ, Globosa—A close growing tree often sold by some dealers as Golden. The foliage is of a darker green than Golden and serves a purpose of variety where Golden are also planted. One foot, \$1; 2 feet, \$2; 3 feet, \$3 each.

Arbor Vitæ, Pyramidal—An upright grower of open habit while small. Naturally takes a pyramidal form, but if sheared to a pillar makes a good looking shaft-like evergreen; not subject to the diseases of the Pyramidal Cypress which we have tried to use for that purpose. \$1 to \$3.

Cypress—We have been experimenting with many varieties of oriental evergreen Cyresses. We thought we had several that we could recommend for this country. We have trees thirty feet high of one or two varieties and we had many lovely specimens embracing fifteen varieties in our grounds. We *thought* we had found a class of evergreen trees that was of value to our people. But the diseases that have stolen in upon them, and the severe tests of extremes in our climate during the last three years have reversed our estimate of the value of this family of evergreens for Southern Texas. We have found that among the *Biotas* (Arbor Vitæ) and *Cedars* we have material with which to obtain quite all of the effects in landscape work for which we had depended upon the Cypress family. We have, therefore, banished from our lists the Cyresses in all of its varieties, and increased our list of Biota and largely increased our culture of the Virginia Cedar.

Red Cedar—We cultivate largely the Virginia Cedar so common east of the Mississippi river. Our trees, being all seedlings, present a great number of varieties each having its peculiar style of form, foliage and general habit, so that we can select cedars bearing almost any required character. Our cedars are all *nursery raised* and have been root pruned four times so that they stand removal well. One foot, 50 cents; eighteen inches, 75 cents; 2 to 3 feet, \$1.00. Larger trees supplied at special rates for special sizes.

Red Cedar Sheared—We have on hand *sheared* cedars so trained that the purchaser can develop any form desired. We sometimes have them imitate the form of the Golden Arbor Vitæ, thus securing another shade of green to give variety to grounds having other low growths. \$1 to \$3.

Retinospora—We have tried every variety of this family that we could hear of. We have failed with all except one. This one comes without a name. We have sent samples to several specialists in order to determine its identity. No two have agreed about it. But it seems to do so well here that we do not propose to throw it aside for want of a name. So not knowing what it should be called and yet being compelled to designate it in some convenient way we shall call it Texas Retinospora until we can know its true name. It has a beautiful healthy-leaved foliage much resembling that of Thunga Ericoides; grows compactly; an ashy green; attains the height of six feet. \$1.

Ceniza (*Leucophyllum Texana*)—We have never known of this shrub being given a place in any catalogue. And yet few are better entitled to admittance. We

think that it ought to be in every family ground of the extreme South, and as far North as it is capable of existing. We at first thought it would only thrive in barren calcareous soils like those in which we find it in nature, but having tested it in various soils we are prepared to say that it will grow in any well drained soil.

A broad leaved evergreen having small oval leaves of ashy color. This color gives the Spanish name to the plant *Ceniza* being the Spanish word for ashes. The leaves have a pungent flavor and are of medical value. When smoked as tobacco they give a singularly soothing effect upon the respiratory organs, often relieving a cough. An infusion of the leaves is employed by the Mexicans and residents of Southwest Texas as a stomachic. It is also chewed in order to tighten loose teeth.

At frequent intervals it produces large crops of purple flowers. It makes a very pretty shrub for an ornamental plot, and we wonder why it has never before been introduced into horticulture. It is found on the Nueces river in Southwest Texas, where it grows from six to eight feet high. On the lower Rio Grande it grows still higher, and in Mexico it reaches still greater size. Price, \$1.

Cape Jasmine—Broad leaved evergreen shrub; bears a large double white flower; very fragrant; a fine yard plant; hardy in Southern Texas; blooms all summer. 50 cents to \$1.

Euonymus Japonica—A bright evergreen shrub, with bright green oval leaves. It will grow 8 to 10 feet if allowed to do so, but looks better if kept to a smaller size by occasionally clipping. 25 to 50 cents.

California Privet—Our choice from among all the privets. It makes a beautiful border for a walk or carriage drive, bears any amount of shearing at any time of year. If allowed to grow tall it will reach 6 to 8 feet and makes a good screen. When unsheared it bears, in the Spring, numerous spikes of pure white flowers. 25 cents each; \$6.00 per hundred. Large quantities and special sizes at special rates.

Budluya Lindbyana—An evergreen shrub with long narrow pointed leaves of bright green. It begins early in the Spring to send up numerous small spikes of lilac colored flowers and continues to bloom till the frosts of the following Fall. 50 cents.

Magnolia Grandiflora—The Magnolia of the South; a very fine broad-leaf; leaves large; flowers very large and showy. *It will fail wherever there is too much lime.* We have it doing well on deep sandy soil with clay sub-soil; bloomed with us five years after planting. \$1 for pot-raised trees.

Pittosporum—Low, broad-leaved evergreen; is suited to be trained into almost any shape required. For pot-raised plants, \$1.

GRASSES.

Gynerium Argenteum (*Pampas Grass*)—A most ornamental plant, with silvery, plume-like spikes of flowers; hardy and thrives in any soil of ordinary fertility. 25 to 50 cents.

Gynerium Roseum (*Rose-colored*)—Flowers of a light rose color. Plumes large and silky. When just appearing they are of a purple tint; this gradually fades until a soft rose tint is attained. 25 to 50 cents.

Erianthus Ravennæ attains a height of ten or twelve feet, throwing up numerous

flower spikes of grayish white; flowers profusely and remains a long time; needs space to show its merits. In fact *none* of these grasses should be crowded. 25 to 50 cents.

Eulalia Japonica Zebrina—It forms compact clumps, sometimes six feet in diameter. Its flower stalks are very graceful and numerous. Its leaves are striped and blotched with gold, the stripes running across the leaves. 25 cents.

Lemon Grass—We do not know the proper botanical designation of this grass. We found it on the lower Rio Grande in almost every garden. Over a large extent of country it is steeped and used as *tea*. I was told at Brownsville, Texas, that in large districts of Mexico the Lemon Grass supplied the only tea known to the poor people of that country. The odor and taste of the bruised leaves remind one of orange peel. It is the favorite drink of the writer whose recovery from a long period of debility has been simultaneous with the use of Lemon Grass tea. Perhaps the grass had nothing to do with the improvement, but the writer is firm in the belief that it *has*. A strong succulent stem developing long, broad leaves. A single plant soon develops a large clump, two or three of which are sufficient to supply a large family with tea. I have never been able to learn of its having flowered in Mexico or Texas. It is propagated by division. 25 cents.

ROSES.

The climate of Texas is well suited to the rose. The annual bloomers so valued at the North are not generally desirable here, not because they fail but because we have such a wealth of constant bloomers that are no more trouble to care for and reward our efforts with so much greater liberality.

Sandy loam is the best soil for roses, and yet they will flourish in almost any soil with proper preparation and care. Old, well-rotted, barnyard manure is excellent; but never apply fresh animal manure to your rose plants. Old, well rotted, chip manure, such as will be found about many old kitchen wood piles is good.

When to plant. In our climate the question of fall or spring planting has little or no force. The main point is to let the vegetation become thoroughly checked by frost before removing the plants. Many customers go wild about getting their plants "*early*." They insist upon the nurseryman delivering *early*, and then afterwards complain because they have lost their plants.

Again, some wait till the Spring growth has begun when it is hazardous to subject the plants to the exposure incident to removal. Avoid both of these extremes. Every nurseryman should have knowledge enough upon the subject to know when his plants are *ready* for removal, and should value his reputation sufficiently to *insist* upon his rights in this particular. But do not urge him into delivering the plants in an immature state, and then blame him for your own fault in the matter.

Planting should be carefully done. Don't let the roots be exposed to the sun or wind. Plants received in good order are often lost between the interval of unpacking and final planting. If you are in doubt how to plant them please consult our chapter entitled *How to Plant a Tree*.

Cultivate Well. Whoever intends the best success must not only give his roses rich soil, but must cultivate the soil thoroughly or expect only partial success. We cultivate our roses with plow cultivator and hoe several times every season—in fact,

as often as conditions seem to require, keeping the soil loose in the immediate region of the plants, and free from weeds and grass. Where the plow and cultivator cannot go we let the grubbing hoe or spading fork do the work.

Pruning is important at planting time. We usually cut our plant sufficiently before they leave our hands. But if we fail to do so the planter should so cut them that they have not more than three or four shoots remaining, at most, and *two* canes are still better. And even these should be shortened to not more than two or three eyes each.

The above remarks apply to the time of planting solely; but also every year there should be a careful pruning. The best season for pruning here is from the middle or last of December to the first of February. It may be done at any time before the Spring growth begins.

Climbing and Pillar Roses need comparatively little pruning, and yet that little should not be neglected. It is not often that we would shorten in a healthy climber, except at the end of the leading shoots when they seem disposed to run farther than is desired, or the side shoots to prevent too much extension in a given direction, or to prevent a more crowded foliage than may be desired. Sometimes it is best to remove more or less side shoots altogether if the plant seems weakening. When it is desired that a removed side shoot should, in course, be restored, then its removal should be so made as to retain two or more eyes. When it is desired to have a more dense growth of foliage then all the shoots may be cut back more or less to induce sub-laterals. In cutting back always cut just above a bud and avoid leaving sharp points. When a sharp point has been unintentionally made it can be remedied by a second cut.

Hybrid Remontant Roses require different treatment. If the *very earliest* blooming is required in the Spring some of the canes of the former year's growth should be retained quite or altogether entire, while the greater number should be cut back to within two eyes of the old wood.

If *abundant blooming* is required without regard to the size of the flowers, the weak shoots only should be cut out and the strong canes cut back about a fourth of the last year's growth. (Remember that this work is supposed to be done *in winter*.) By the above treatment the flowers will be small but very abundant and showy.

But if the flowers are required to be as large and perfect as possible, the weak wood should all be removed, and all of the strong ones of last year's growth cut back to within two or three eyes of the old wood.

China Roses, and all having a bushy habit, we manage upon another plan. If a large bush is required we let it grow up at will, thinning out the tops only when they become too crowded, and remove any dead or dying wood. Some varieties will, in this way, attain an enormous size. We have a Louis Phillippe that sometimes has about 1,000 roses at once. But most persons do not want their roses to attain such proportions.

If it is required to confine them to a limited space then I would follow the plan of cutting out the oldest wood and preserving the new whenever a reduction of the size of the bush was desired, of course waiting for the proper conditions of growth under which to do the work.

The Bourbon Roses are impatient of much cutting, and therefore we confine our cutting mostly to the removal of dead or dying portions.

Removing Rose Buds. Some imagine that it will injure their plants to let them bloom heavily, and they therefore remove the young rose buds to prevent blooming, in order to strengthen the plant. To such we will say that it does the plants no harm to bloom. But when a bloom is fully matured and begins to drop its petals, this is the signal that the plant has begun to *form seed*, and the formation of *seeds* does tax the energy of the plant. Therefore remove the dilapidated rose at once, and remove every *seed bud* that you discover, so as to preserve every energy of the plant for the production of flowers.

OUR ROSES.

We have cultivated a large number of varieties on our premises, and found so many of them so much resembling each other that we have concentrated our efforts at propagation upon a smaller number that are more clearly distinct.

In every department of horticulture there are always some *specialists* whose great "*specialty*" seems to be to laud the praises of some NEW variety which they offer at rare rates. Next, when their bubble bursts, they select another and then another. Sometimes they take up some *old* variety, giving it a new name if the purpose requires it, and having just discovered that it has very special merits, they sing its virtues for a season—and so they go on from year to year wringing money from a too credulous public.

The rose trade is not exempt from such adventurers. We have made investments in these articles of short-lived glory that have cost us their weight in gold. And yet none of the solid improvements that we have ever made in building up our collections in any department have come from these *noisy* specialists.

We *originate* no roses. We obtain our original stock from those who do sufficient business to afford to keep a corps of professional rose growers who are competent to test the material passing through their hands, and who make up their lists under every advantage. Having secured varieties that bear the tests of our region, we then add them to our list for propagation for our trade.

We disseminate no cheap, hot-house, *baby* rose plants, but supply with *open ground field plants* that will give satisfaction whenever our customers give them the proper conditions of success.

LISTS OF ROSES.

Price of Roses.—At nursery, strong plants, 50 cents each; \$5 per dozen except where otherwise stated. Rare varieties not named in this list and special assortments will be supplied at special rates.

CHINA, TEA, AND BOURBON ROSES.

Aristides—White, buff center; Tea.

Azelia Imbert—Canary yellow; Tea.

Cheshunt Hybrid—Cherry carmine, shaded violet: of vigorous growth, very large rose, free Spring bloomer, but rarely blooms in Summer. Hybrid Tea.

Capt. Christie—Flesh, with deeper center; free bloomer, fine flower, dwarf, thornless. Hybrid Tea. \$1.00.

Climbing Devoniensis—See Noisette and other Perpetual Climbers.

Duchere—White, free bloomer. China.

Empress Eugenie—Large, very full, beautifully cupped; delicate rose; an extra good flowerer. Bourbon.

- Etoile de Lyon**—Large, full, canary yellow. Tea.
Louis Phillippe—Dark crimson, often silvered center. China.
Madame Alfred Corrier—Pure white, sometimes tinged with flesh; very free and constant bloomer. Hybrid Tea.
Marshal Niel—Deep canary yellow, sometimes a tinge of pink shading; large and full, a free bloomer, has not generally succeeded with us on its own roots. We supply it only budded on strong stocks. Climbing Tea. 75 cents each.
Pink Daily—Pretty buds; not a fine rose but desirable on account of its extra blooming habits. China.
Picayune—Pale pink; very small, often not larger than a dime; double; a cute little curiosity; constant bloomer. China.
Perle de Lyon—Dark yellow; one of our best yellow Teas.
Zelia Pradel—One of our purest white roses; half climber. Tea. When ordered alone 75 cents.

HYBRID REMONTANT ROSES.

This class should comprise the main bulk of every collection. They are all hardy, upright growers and produce large flowers.

- Achille Gonod**—Lilac rose; very large bloom; good bloomer; one of the best.
August Von Gert—Bright lilac rose.
Adam Paul—Large, open flower, pink, good bloomer.
Blanch de Meru—Light flesh.
Belle of Normandy—Lilac pink, large and sweet.
Bessie Johnson—Light blush.
Crown Prince—Purplish crimson.
Duc de Cazes—Purplish red, shaded violet; dwarf growth.
Dr. Sewell—Crimson scarlet, shade purple.
Duke of Connaught—Deep crimson, velvety; dwarf habit; not a very free bloomer.
Fanny Pitzold—Clear satin rose.
Gen. Jacqueminot—Fiery red; an old popular variety much called for, but we think there are several better roses.
Infant of Mt. Carmel—Clear, bright rosy pink; large and very double; an old rose but too good to lay aside.
John Nesmith—Brilliant deep red.
Louis Odier—Clear satin rose.
La Reine—Deep rosy lilac; a standard old variety.
Marshal Suchet—Deep carmine pink.
Magna Charta—Bright pink.
Madame Moreau—Deep brilliant carmine, changes to purple; perpetual bloomer; our favorite of its class. 75 cents.
Princess Louise Victoria—Deep crimson changing lighter.
Princess Mathilde—Dark crimson shaded purple.
Prince Albert—Deep crimson.
Paul Neyron—Deep pink; one of our very largest roses.
Perle des Blanches—Pure white; free bloomer; a strong competitor of Zelia Pradel.
Peonia—Crimson red.
Prince Camille de Rohan—One of our darkest crimson roses.
Sidonie—Light pink; our favorite of its color and class.
Vulcan—Velvety crimson changing to purple.

NOISETTE AND OTHER PERPETUAL CLIMBERS.

Chromatella or Cloth of Gold—Very large; chrome yellow; budded on manetti. 75 cents.

Climbing Devoniensis—Tea, white, creamy center.

James Spunt—A climbing China, dark crimson.

Jules Jurgensen—Magenta-centered shaded violet.

Marechal Niel—Deep canary yellow; large and full; a free bloomer; grows best budded on some strong stock.

Octavia—Deep crimson, strong grower; small double flower; very constant bloomer.

Reine Marie Henriette—Bright cherry red, good form and vigorous habit.

Woodland Margaret—White, vigorous; a very constant bloomer.

POLYANTHA ROSES.

A new class of roses produced by crossing the Japan type and Texas.

Cecile Brunner—Flowers about one and a half inches in diameter; salmon pink, deeper center; beautifully formed.

Mignonette—Delicate rose changing to blush; flowers very small, blooming in enormous profusion. Almost constantly in bloom during the whole growing season.

Paquerette—Pure white; flowers very small; free bloomer.

ANNUAL BLOOMING ROSES.

Valuable at the North but should never be planted here where we have such a wealth of free bloomers. We carry only a very small stock of these roses, confining ourselves altogether to such as are most called for. We feel that every customer who buys one is getting nothing for his money. We put them into our list only because the demand requires it. We shall be glad when the demand ceases altogether.

George the Fourth—Dark velvety crimson, changes to purple; a beautiful flower; blooms splendidly for about two weeks and then waits for the following year.

Mrs. Hovey—Medium size flower; very double; blooms very abundantly during its season.

Baltimore Belle—Pale blush, variegated carmine; a very strong grower; we use it as a stock on which to bud Marshal Niel.

Queen of the Prairie—Clear bright pink, large, compact, very double and full; blooms in clusters; is one of the finest of all the Prairie roses.

Seven Sisters—Small flowers in large clusters; varies in color from white to crimson.

MOSS ROSES.

For several years we maintained a quite full collection of Moss Roses. We have not been pleased with their general behavior. Most of them are Spring bloomers, but a few of them bloom occasionally and are called Perpetual.

Eugene de Savoie—Pink.

Salet—Pale rose, perpetual.

Glory of Mosses—Light pink, compact habit.

Zobride—Pink.



HONEY PEACH.

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ENTRANCE VIEW TO THE MISSION VALLEY NURSERIES.

